Engineering Library

Railway Age

DAILY EDITION

FIRST HALF OF 1919—No. 25b NEW YORK—SATURDAY, JUNE 21, 1919—ATLANTIC CITY SIXTY-FOURTH YEAR

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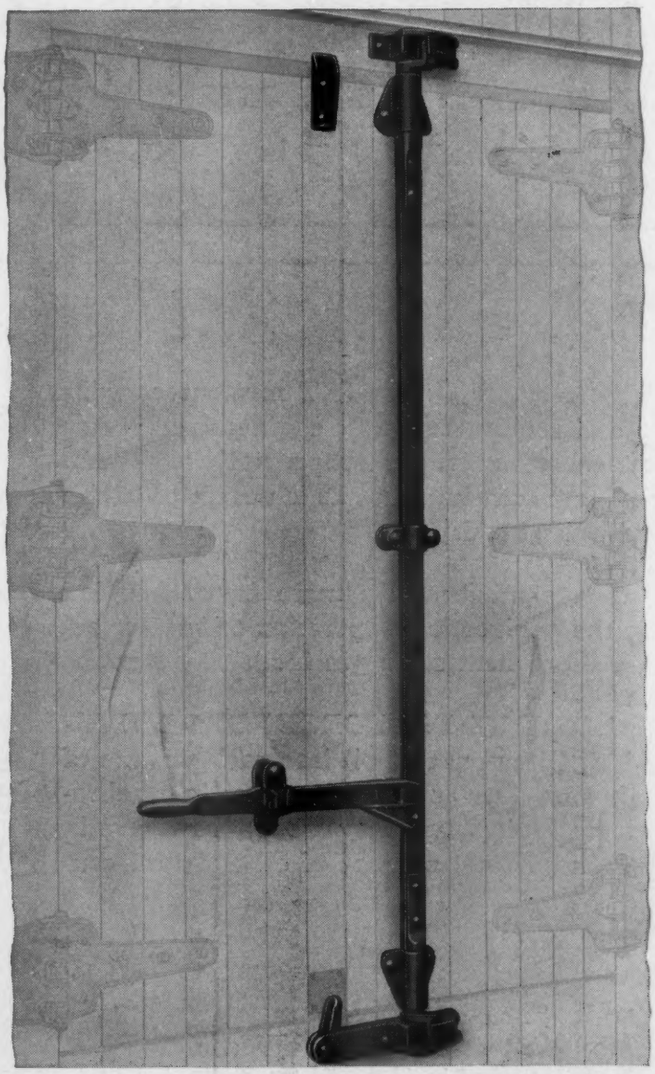

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STANDARD PRACTICE ON MANY RAILWAYS

ALWAYS GIVES SATISFACTION

PIER SPACE 584-585

W. H. MINER CHICAGO

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FROM WAR TO PEACE

We were busy during the war on the works of war. We are busy now cultivating the activities of peace.

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GREATER ACCURACY IN CUT-OFF ADJUSTMENT must necessarily have its effect on the coal pile. It is difficult to secure the engineer's co-operation in this respect when the valves and cylinders are not properly lubricated. It is not uncommon to hear an engineer complain that he is unable to "hook her up" because the valves and cylinders are dry.

With internal friction reduced to the minimum, a more easily handled reverse lever must follow, inviting the engineer's co-operation to greater accuracy in cut-off adjustment, with a subsequent saving in fuel and water.

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LOCOMOTIVE LUBRICATOR COMPANY

Booth No. 574, Atlantic City, N. J. **1202 Tower Bldg., Chicago, Illinois**

Railway Age

DAILY EDITION

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WE GUARANTEE that of this issue, 17,125 copies were printed; that of these 17,100 copies, 15,406 were mailed to regular paid subscribers to the Railway Age and the Railway Mechanical Engineer; 119 were mailed to advertisers, 300 were provided for counter and news companies' sales, new subscriptions, bound volumes, copies lost in the mail and office use; and 1,300 copies for distribution at Atlantic City.

THE RAILWAY AGE is a member of the Audit Bureau of Circulations (A. B. C.) and the Associated Business Papers. (A. B. P.)

The prediction has been made that the discussion of the reports at the convention will gradually grow less and less because under the better methods of organization which are being planned for the making up and working of the various committees, the reports will be so thorough and complete that there will be little need of very much general discussion. It is extremely doubtful whether this prediction will prove correct or that it would be desirable. It is true that there is a great deal of useless discussion that can be eliminated if the members generally study their reports carefully in advance. The great value of the conventions, however, is in having a large number of capable men from all sections of the country to criticise any statements that may be made or to suggest improvements or modifications in the findings of different committees. It may even be desirable for the General Committee deliberately to plan to insure having several of the best posted men in the country on each particular subject present to discuss each report. Some of the general engineering societies and two or three of the railroad clubs have got excellent results by specifically inviting different men well in advance of the time of meeting to discuss certain points in the reports which these men are particularly well fitted to talk on. The more thorough and complete the reports are, the greater the importance and value of having such expert discussion. This means that special and intelligent effort must be made to develop it.

Discussing the Reports

No action taken by the Master Car Builders' Association in recent years is so far-reaching in its effects as the adoption of the type *D* coupler. The development work was a matter with which the committee was principally concerned, but the maintenance of the coupler is of interest to all car men. For that reason it is to be hoped that every one attending the conventions will avail himself of the opportunity to visit the exhibit prepared by the Coupler Committee in co-operation with the coupler manufacturers. The exhibit of gages to insure interchangeability of parts is an indication of the care that is taken by the makers to secure satisfactory operation. The railroads must do their part to obviate trouble, and one of the best ways of attaining this end is to see that the construction and operation of the coupler is thoroughly understood. The descriptive circular distributed at the convention has been prepared with great care and merits the widest possible distribution.

The Coupler Exhibit

Several of the railway supply manufacturers have stated that this is the most businesslike convention that has ever been held, and they hope that the high standard which has been set will be maintained and even raised still higher in the years to come. Various reasons are given for this change in spirit, such as its being part of the after-effect of the war, which is noticed generally, or the fact that there has been no convention for three years. Still others say it is because of the larger and more general attendance of railroad men, a very large number of whom come from long distances and who are at the meetings for the first time. Then, too, there are those who say that the most important factor is the suggestion that was made to the regional directors that the various representatives from each road be asked to report back to their managements in writing on the important and practical things that were drawn to their attention at the convention. Whether any one of these factors is more important than the other it is, of course, impossible to say. One thing is certain, the railroad men generally are making the most of their opportunity to get practical suggestions and the railway supply manufacturers feel that they have been mighty well repaid for the effort that they have made to bring their exhibits to Atlantic City. It may not be amiss to suggest that it is not too soon for the heads of the railway and railway supply associations to get together and, after analyzing the situation thoroughly, to start to prepare for the next convention along such lines as will insure continuing and further developing the businesslike spirit which has so thoroughly entered into the convention this year.

A Businesslike Convention

Increase Facilities for Car Repairs

THE SHORTAGE OF CAR REPAIR FACILITIES on American railroads was very strikingly brought out by the unusual conditions which existed during the war. The heavy traffic which the railroads were compelled to handle taxed the capacity of the rolling stock to the utmost and made it necessary to use every car which could turn a wheel. This resulted in serious deterioration of rolling stock, which bad order reports did not reflect. Figures compiled by the Mechanical Section of the Railroad Administration during the latter part of 1918, while they

showed a very good percentage of bad order cars and also indicated that the daily accumulation of bad orders was about balanced by the daily output of repairs, showed a much higher ratio of bad order cars shopped for heavy repairs than the ratio of the output of heavy repairs to the total number of cars repaired. Of course, this was in a measure due to conditions other than a lack of shop facilities, such for instance, as shortage of labor and the necessity for an early return of the cars to service; in the main, however, it could have been prevented had the railroads been provided with adequate car shop facilities.

Steel cars have now been in service for about twenty years and the extent of their use has been growing continually during that time. Adequate facilities to make heavy repairs to these cars, however, have not been provided and the time has now come when large numbers of them have reached the age where these facilities are badly needed. Many of the eastern roads and some of those in the southeast have provided shops equipped especially for handling steel car work. The western roads, however, have not anticipated their requirements and are seriously short of steel car repair facilities. With the lessons taught by the war fresh before them, it should be the duty of mechanical department officers carefully to consider and formulate plans for shop facilities which will be adequate to meet their requirements. The present situation with respect to capital expenditures will not continue indefinitely and it is well for the roads to have their programs laid out, ready to put into action when conditions change so that capital may be provided.

Limiting Loads for Freight Cars

THE COMPREHENSIVE STUDY of the factors affecting the permissible capacity of freight cars is a piece of work for which the Committee on Car Trucks deserves to be commended. While the proposed methods of marking cars are a radical departure from the former practice, they are more logical, and the change should be welcomed by both shippers and railroad employees. The last paragraph of Interchange Rule 3-d, which was to be effective October 1, 1920, would have made it necessary to reduce the allowable loads for cars having axles of less capacity than required by the sum of the light weight and the marked capacity. If the committee's recommendations are adopted the maximum axle capacity will be made the basis for increases as well as decreases in the permissible loads.

The capacity of some of the equipment now in service will be appreciably changed by the new rules. The allowable load on cars of 60,000 lb. capacity will in general be decreased, while on the heavier equipment and notably on the 80,000 lb. capacity cars there will be an increase (assuming that the car bodies are considered strong enough to carry the extra weight). The load limits established for cars with non-M. C. B. standard axles should result in such axles being retired rapidily. Statistics regarding the number of cars that will be affected were furnished by only one road, but this probably represents a large proportion of the total equipment. Whatever the results, the committee's action seems fully justified considering the time that has elapsed since the adoption of the M. C. B. standard axles.

The new method of determining the allowable load may have an appreciable effect on the design of cars. In the past the desire to reduce the deadweight carried has been the only incentive for designing light cars. The proposed rules will give light cars a double advantage: not only will the deadweight be less, but the maximum load will be increased as well. Of course, the stresses in the car will increase as the load increases and no very great reduction in weight will be feasible. The problem is to balance the saving in transportation expense against the cost of repairs. If the proportion of paying load can be increased by lighter construction, such design may prove economical, even though it results in higher maintenance costs for the equipment.

Important Effect of A. R. A. Meeting Here

ONE OF THE ILLUSIONS which many railway executives and operating officers have cherished for years has been that the mechanical conventions were largely junkets. Few of them have appreciated the large amount of important work done at the conventions and the great educational value of the exhibit of equipment and supplies made in connection with them.

Because this misunderstanding has prevailed so widely, the visit of the executive committee of the American Railroad Association to the pier on Thursday was of very great importance. By the reorganization of the American Railroad Association the mechanical associations have lost their independence and in consequence, to a large extent, the future of the conventions and of the exhibit depends upon the attitude that would be assumed in future by the operating executives.

The comments made by members of the executive committee who were here—comments made both in public and in private—make certain that most or all of them have gone away from Atlantic City with a realization of the fact that the conventions and the exhibit constitute a great educational institution, which contributes more than can be estimated to broadening the vision and increasing the efficiency of the officers of the mechanical departments of the railways. It is a fact that in years long past there was conduct at the conventions which would not have borne close scrutiny. The conventions have suffered ever since from a taint acquired at that time. But for many years there have been no cleaner and more wholesome gatherings than the mechanical conventions.

There never was a doubt that the mechanical conventions would be continued to be held, but there has been talk at times of taking them some place where the exhibit could not be held. This would have been a serious mistake, since from an educational point of view the exhibit is fully as valuable as the convention sessions. The visit of the members of the executive committee to the pier this week cannot fail to have the effect of making the operating executives, generally, regard in a very favorable way the sessions which are hold here and the exhibit which is made, and the more operating executives that attend the conventions, the more favorable their impression of the value of the sessions and the exhibit will become.

Since the mechanical associations have been merged into a section of the American Railroad Association it would seem that there is good reason why the executive committee of the A. R. A. should in future meet once a year where the mechanical convention is held and look over the exhibit. The enterprise of the railway supply manufacturers deserves this recognition, and it would be very beneficial to the railways for the higher operating officers to keep in touch with the progress being constantly made by the supply companies in the design and manufacture of equipment and supplies.

Program for Today and Tomorrow

Saturday, June 21, 1919

9.30 A. M. TO 12.00 M.

Discussion of Report on Train Lighting and Equipment
Consideration of Rules of Order.. 9.30 A. M. to 10.00 A. M.
Election of Officers, General Committee and Nominating Committee—Presentation of Badges to retiring Officers, Etc. ..... 10.00 A. M. to 12.00 M.

ENTERTAINMENT

10.30 A. M.—Band Concert at Entrance Hall, Million Dollar Pier. Royal Scotch Highlanders' Band.

8.30 P. M.—A special program has been prepared in appreciation of the railway and railway supply men who went into the service during the war. The speakers will be Franklin D. Roosevelt, Assistant Secretary of the Navy; Brigadier-General W. W. Atterbury, Col. Henry W. Hodge, and Senator Walter E. Edge, New Jersey's war governor.

Sunday, June 22, 1919

3.30 P. M.—Sacred Concert. Music Rooms of Marlborough-Blenheim. Fry Philharmonic Orchestra.

Pictures from the Front

ON SUNDAY EVENING, at 8.15, an entertainment will be given on the pier. The program includes the presentation of an interesting series of motion pictures, representing large naval guns in action in France. These pictures will be exhibited by the United States Navy, and a naval officer will be present to explain them.

Lost and Found

LOST—Badge No. 2425, issued to W. S. Clock. If found, please leave at the *Railway Age* booth.

LOST—Lady's badge No. 4334, lost last night on pier. Mrs. H. E. Graham, Room 1306, Hotel Traymore.

LOST—On dance floor, Thursday night, badge No. 4209. Mrs. J. E. Gierney, L. & A. Railway, Room 35, Hotel Sterling.

LOST—R. S. M. A. badge No. 2425 by Mr. Clock, Joyce-Cridland Company, Strand Hotel.

LOST—Bar pin, gold, three inches long, with square blue stone. E. D. Knapp, Iroquois Hotel.

LOST—R. S. M. A. badge No. 3226. Please return to the office of the Enrollment Committee or any member.

LOST—R. S. M. A. badge No. 5349. Return to Enrollment Committee.

Railway Artillery

THE CONVENTION ATTENDANTS have a real treat before them in a special feature which was arranged for too late to go on the official program but which will precede the informal dance on Monday evening. Major E. D. Campbell, of the Railway and Seacoast Section, Artillery Division, Ordnance Department, United States Navy, has been assigned by the Navy Department to deliver an illustrated lecture on Railway Artillery. Readers of the *Railway Age* have followed with much interest the development and use of railway artillery during the war and will undoubtedly appreciate the importance of this announcement. The lecture will be given in the Hippodrome at 9.00 P. M. Following it a representative of the Navy Department will show pictures illustrating the effect of the 14-in. guns on the other side.

Traveling Engineers' Meeting

THE EXECUTIVE COMMITTEE of the Traveling Engineers' Supply Men's Association will hold a meeting in the Green Room of the Marlborough-Blenheim at one o'clock Saturday.

The Grand Ball

IT IS GENERALLY CONCEDED that the social events of the week have been delightful affairs, but it must be admitted that last night's event on the Million Dollar Steel Pier eclipsed all previous social functions. It was the convention grand ball. Fully three thousand conventionites were in attendance.

At 10 o'clock the grand march was started. It was headed by the officers and members of the executive committee of Mechanical Section III, American Railroad Association, and their ladies. The ball room of the pier certainly never presented a more beautiful sight. At the conclusion of the march the Royal Scotch Highlanders' band began a twenty-dance program. The pleasure was continued until long after midnight.

William M. Wilson, Chairman, was ably assisted in the management of the evening's entertainment by the following: G. A. Nichol, R. J. Himmelright, J. C. C. Holding, J. L. Paxton, L. O. Cameron, N. C. Naylor, Ellsworth Haring and H. E. Passmore.

R. S. M. A. Annual Meetings

THE DISTRICT MEETINGS of the Railway Supply Manufacturers' Association will be held from 9 A. M. to 10.30 A. M. this morning in the Executive Committee Room, which is next to the Enrollment Booth. It will be necessary for the third district (Pennsylvania) to elect two men to the Executive Committee for three years; for the fifth district (Illinois, Wisconsin, Iowa and Minnesota) to elect one member for three years, and for the sixth district (Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Kentucky and Tennessee) to elect one member for three years. A special election is also necessary for the fourth district (Ohio, Indiana and Michigan) to elect a member to serve one year to fill the unexpired term of J. F. Schurch, who has moved out of the district.

The annual meeting of the Railway Supply Manufacturers' Association, itself, will be held at 11 o'clock this morning in the Hippodrome. It will be necessary to elect a president and a vice-president. The nominating committee on Wednesday nominated W. S. Bartholomew as president and J. F. Schurch as vice-president. Mr. Bartholomew found that it would impossible for him to accept the nomination. Following the receipt of a letter to this effect, it was necessary to hurriedly circulate a petition in order that another nomination be posted, in accordance with the requirements of the Constitution and By-Laws, before six o'clock last night. George R. Carr, who is a member of the Executive Committee representing the Fifth District and who is a vice-president of the Dearborn Chemical Company, was nominated.

Just before six o'clock last evening a petition placing George Hull Porter, of the Western Electric Company, in nomination for the office of vice-president of the Railway Supply Manufacturers' Association, was posted

on the bulletin board on the Million Dollar Pier. Mr. Porter will therefore be Mr. Schurch's opponent for the office of vice-president at the election to-day.

Important Special Program for This Evening

COMPLETE DETAILS concerning the special program this evening were not available when the official program was published. The nature of the meeting is so important that the Railway Supply Manufacturers' Association, which has the program in charge, is desirous of giving the information concerning the program as widespread publicity as possible. A great many of the railway men and railway supply men were called into the service during the war; many of them in uniform and many to help in looking after the necessary work behind the lines on this side. It is quite appropriate, therefore, that recognition of this service should take the form of a patriotic program in appreciation of the work done by these men.

The committee in charge has been fortunate in securing as speakers Franklin D. Roosevelt, Assistant Secretary of the Navy, who will speak for the administration on behalf of the War and Navy Departments; Colonel Henry W. Hodge, who was Assistant Chief Engineer of the American Expeditionary Forces and who will tell of the achievements of the railway men in France, and Senator Walter E. Edge, who was Governor of New Jersey during the war. It is expected that Brig. General W. W. Atterbury, who did such splendid work as Director General of Transportation of the American Expeditionary Forces under General Pershing, will deliver an address.

R. H. Aishton Praises the Exhibit

THE MOST ENTHUSIASTIC man on the pier yesterday regarding the exhibit of equipment and supplies made by the railway supply manufacturers this year was R. H. Aishton, regional director of the Northwestern region and new president of the American Railroad Association. Mr. Aishton, accompanied by General Secretary Fairbanks, of the A. R. A., arrived on the pier early yesterday morning and was shown through the exhibit by E. H. Walker, president of the Railway Supply Manufacturers' Association. He and Mr. Fairbanks saw the entire exhibit as thoroughly as could be done in a half day. After he had finished his tour of inspection Mr. Aishton said:

"I confess that before coming here I had no adequate idea of the magnitude, completeness and importance of this exhibit. The railway supply manufacturers of the United States deserve the greatest credit for having made such an exhibit, especially under present conditions and in view of the fact that for two years they have had nowhere near a normal business. It is a fine expression of their optimism as well as their enterprise.

"The railway executives of the country have not appreciated the value and importance of the exhibit in past years because most of them have not seen it. Its educational value, especially to mechanical officers, could hardly be exaggerated. I cannot imagine anything which would do more to increase the railway mechanical officers' efficiency than to come and spend six or seven days thoroughly studying the equipment and devices being shown, their uses and methods of operations. Furthermore, it would be of great value to the railways to have their purchasing agents come here and thoroughly inspect the exhibit. I am extremely glad to have had opportunity to see this one and I hope to see more of them in the future."

Mr. Aishton was accompanied to Atlantic City by Mrs. Aishton and they stayed until yesterday afternoon, when they started on their return homeward to Chicago.

Railway Club Secretaries Meet

ONLY TWO ORGANIZATIONS enrolled in the Society of Railway Club Secretaries were not represented at the adjourned annual meeting of the society Friday morning, at the Blenheim. The session lasted several hours with A. J. Merrill, of Atlanta, presiding. While much of the time was taken up with an interchange of experiences as to practices and methods in handling club work, several subjects of special interest to executive officers and club members were discussed.

It was agreed that in view of the suspension of activities during the war period and the condition of the treasury it would not be necessary to ask the clubs to contribute the usual assessment this year. In addition to economizing in running expenses the society invested in a Third Liberty Loan bond and hopes to be able to hold it in reserve until its payment becomes due.

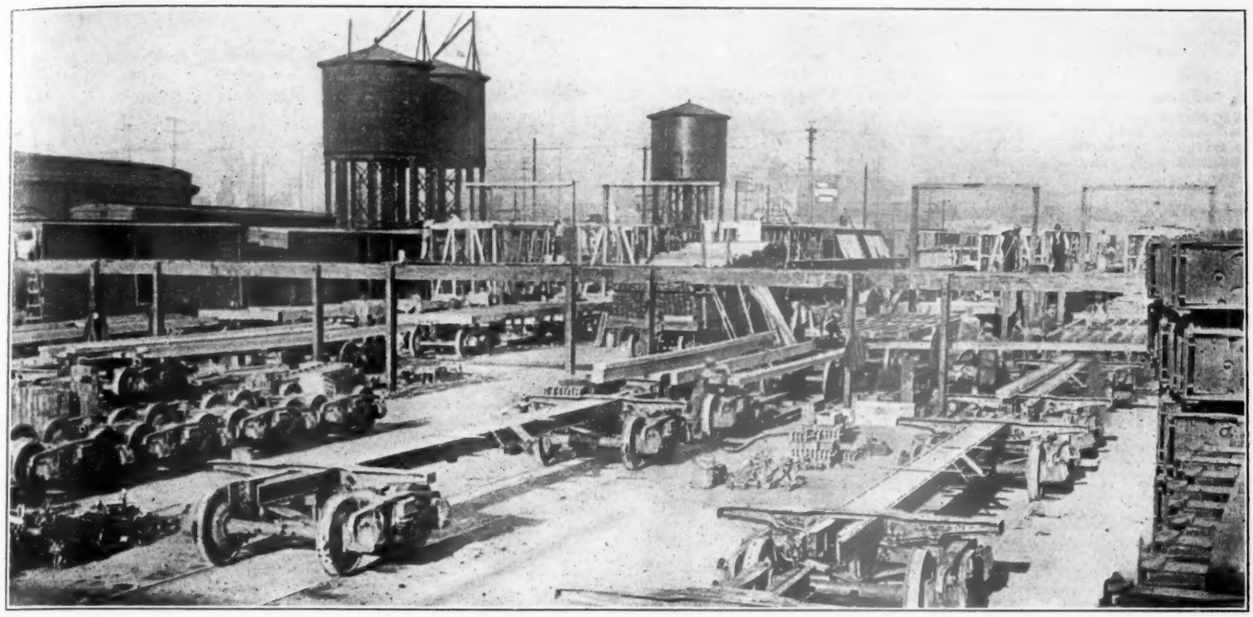
Vice-President Wood, of the Pacific Railway Club, after conferring with the secretaries, and having attended their luncheon, stated that he was much impressed by the earnestness and activity shown, and on his return home would recommend that his club become a member of the society.

The possibility of the western club resuming its membership was the subject of an encouraging report. It was decided that future annual meetings in connection with the Mechanical Section of the American Railroad Association shall be held on the first Saturday of the convention period, preceded on the previous Friday by a "Round Table Luncheon," each secretary to arrange for the attendance as a guest of the society of the highest ranking officer of his club present at the convention.

In connection with a referred subject from the New York and Central Clubs, an adverse decision was reached as to whether it would be advantageous for railroad clubs to identify themselves with the activities of the National Engineering Council organized in Chicago. The reason was that as railroad clubs have not a large representation of the engineering profession in their membership and the various engineering societies being actively identified with the work contemplated by the promoters of the council, it would be an undesirable duplication of membership for the railroad clubs to unite with it.

In considering conditions incident for two years to the attitude and policy of the postoffice department with respect to the postal privileges of the clubs in mailing Official Proceedings, it was agreed to recommend to the executive committees that as the clubs have a combined membership of 8,000 or more, they should unite in petitioning the Postmaster-General to reopen the matter, and give it his personal consideration. It is believed that if this can be accomplished, the question can be presented in a manner calculated to secure more favorable consideration. After electing the following officers for the ensuing year, the society adjourned subject to call:

Chairman, A. J. Merrill, Atlanta, Ga.; Vice-Chairman, W. E. Cade, Jr., Boston; Secretary-Treasurer, Harry D. Wright, New York City.



Building Freight Cars at Los Angeles on the Southern Pacific. Copyright by International Film Service.

American Railroad Association, Section III, Mechanical

Report of Proceedings for Friday; Convention Hall Crowded; Lively Discussion

THE FRIDAY MORNING session of the American Railroad Association, Section III, Mechanical, was called to order by Chairman Chambers at 9.40 o'clock.

The chairman stated that the Committee on Safety Appliances had submitted a written report, because it was not possible to have it printed in time for the convention.

Report of the Standing Committee on Safety Appliances

NO REPORT WAS PRINTED by the Committee on Safety Appliances, because it was not possible to get the information together to draft such a report. The information, however, reached the chairman on June 16 and the attached report has been compiled for your consideration. It will be noted that this includes the total number of cars owned in each region, the total number equipped with safety appliances, those remaining to be equipped, and the percentage remaining to be equipped as per cars owned. The totals of all regions are also shown, from which it will be noted that there are still 89,645 cars to be equipped, or 3.8 per cent of the equipment owned. This should receive vigorous action from all roads until such cars are so equipped.

EXHIBIT A

STATEMENT OF FREIGHT CARS EQUIPPED AND REMAINING TO BE EQUIPPED WITH SAFETY APPLIANCES AS OF MARCH 31, 1919

Regions	Total Freight Cars Owned	Equipped with Safety Appliances	Remaining to be Equipped	Per cent of Cars Owned Remaining to be Equipped
Eastern	604,622	580,425	24,197	4.0
Allegheny	467,099	448,004	19,095	4.1
Pocohontas	107,857	105,214	2,643	2.5
Southern	299,166	290,497	8,669	2.9
Central Western	334,791	325,462	9,329	2.8
Southwestern	168,284	158,621	9,663	5.7
Northwestern	390,949	374,900	16,049	4.1
TOTAL	2,372,768	2,283,123	89,645	3.8

EXHIBIT B

EASTERN REGION

STATEMENT OF FREIGHT CARS EQUIPPED AND REMAINING TO BE EQUIPPED WITH SAFETY APPLIANCES AS OF MARCH 31, 1919

Railroads	Total Freight Cars Owned	Equipped with Safety Appliances	Remaining to be Equipped	Per cent of Cars Owned Remaining to be Equipped
Ann Arbor	1,960	1,243	717	36.6
Bangor & Aroostook	5.034	4.353	681	13.5
Boston & Albany	7,612	7,603	9	.12
Boston & Maine	21,039	20,993	46	.2
Buffalo, Roch. & Pittsburgh	17,697	15,438	2,259	12.7
Central Vermont	2,816	2,656	160	5.68
Chicago, Ind. & Louisville	6,201	5,978	223	3.6
Cinn., Ind. & Western	2,440	2,013	427	17.5
Cincinnati Northern	1,596	1,468	128	8.0
Clev., Cin., Chic. & St. Louis	33,210	32,131	1,079	3.2
Delaware & Hudson	18,705	18,522	183	.98
Del., Lack. & Western	28,439	28,422	17	.05
Detroit & Mackinac	1,487	1,407	80	5.3
Det., Toledo & Ironton	3,092	2,951	141	4.5
Det., Toledo Shore Line	201	201	0	.0
Erie	59,266	56,689	2,577	4.57
Grand Trunk Western	6,002	5,028	974	16.2
Hocking Valley	14,446	14,203	243	1.6
Kanawha & Michigan (including K. & W. Va.)	6,406	5,920	486	7.29
Lake Erie & Western (including Northern Ohio)	3,374	3,227	147	4.4
Lehigh & Hudson River	531	531	0	.0
Lehigh & New England	3,529	3,529	0	.0
Lehigh Valley	42,601	42,535	66	.16
Maine Central	8,585	8,476	109	1.26
Michigan Central	34,651	33,482	1,169	3.27
New York Central	136,350	128,630	7,720	5.21
New York, Chi. & St. Louis	11,626	10,535	1,091	9.0
New York, New Hav. & Hartford	38,437	37,395	1,042	2.79
New York, Ontario & Western	5,422	4,996	426	7.57

Railroads	Total Freight Cars Owned	Equipped with Safety Appliances	Remaining to be Equipped	Per cent of Cars Owned Remaining to be Equipped
Pere Marquette	15,920	15,845	75	.47
Pittsburgh & Lake Erie	33,506	33,051	455	1.3
Pittsburgh & Shawmut	2,373	2,360	13	.54
Pittsburgh & W. Va	3,246	3,246	0	.0
Rutland	2,464	2,433	31	1.2
Toledo & Ohio Central	9,480	9,245	235	2.37
Toledo, St. Louis & W	2,682	2,512	170	6.4
Ulster & Delaware	170	170	0	.0
Wheeling & Lake Erie	7,809	6,984	825	10.42
New York, Susq. & W	2,638	2,572	66	2.5
Detroit Bay City & W	112	101	11	9.8
Central Indiana	157	124	33	21.0
Susquehanna & N. Y	176	105	71	40.3
Central New England	1,134	1,122	12	1.1
TOTAL	604,622	580,425	24,197	4.0

STATEMENT OF FREIGHT CARS EQUIPPED AND REMAINING TO BE EQUIPPED WITH SAFETY APPLIANCES AS OF MARCH 31, 1919
ALLEGHENY REGION

Railroads	Total Freight Cars Owned	Equipped with Safety Appliances	Remaining to be Equipped	Per cent of Cars Owned Remaining to be Equipped
Balt. & Ohio (Entire)	97,197	88,463	8,734	8.8
Bessemer & Lake Erie	15,708	15,305	403	2.6
Buffalo & Susquehanna	3,236	3,169	67	2.1
Central R. R. of N. J	27,182	25,679	1,503	5.5
Cumberland Valley	596	520	76	10.6
Grand Rapids & Indiana	2,969	2,755	214	7.0
Long Island	1,214	1,168	46	3.0
Pennsylvania Lines East	168,387	165,341	3,046	1.8
Pennsylvania Lines West	95,006	91,012	3,994	4.2
Philadelphia & Reading	42,144	41,321	823	1.9
Staten Is. Rapid Transit				0.0
Western Maryland	13,460	13,271	189	1.4
TOTAL	467,099	448,004	19,095	4.1

STATEMENT OF FREIGHT CARS EQUIPPED AND REMAINING TO BE EQUIPPED WITH SAFETY APPLIANCES AS OF MARCH 31, 1919
POCOHONTAS REGION

Railroads	Total Freight Cars Owned	Equipped with Safety Appliances	Remaining to be Equipped	Per cent of Cars Owned Remaining to be Equipped
Chesapeake & Ohio	48,162	45,576	2.586	5.3
Norfolk & Western	50,648	50,614	34	0.07
Virginian	8,897	8,897		0.0
Ashland Coal & Iron	150	127	23	15.3
TOTAL	107,857	105,214	2,643	2.5

STATEMENT OF FREIGHT CARS EQUIPPED AND REMAINING TO BE EQUIPPED WITH SAFETY APPLIANCES AS OF MARCH 31, 1919
SOUTHERN REGION

Railroads	Total Freight Cars Owned	Equipped with Safety Appliances	Remaining to be Equipped	Per cent of Cars Owned Remaining to be Equipped
Alabama & Vicksburg	1,058	1,058	0	0.0
Atlanta, Bir. & Atl	2,921	2,815	106	3.0
Atlantic Coast Line	29,502	27,811	1,691	5.0
Atlanta & West Point	1,548	1,439	109	7.0
Carolina, Clinch. & Ohio	6,708	6,544	164	2.7
Central of Georgia	9,567	9,136	431	4.3
Charleston & W. Car	938	899	39	3.0
Florida East Coast	1,964	1,963	1	0.5
Georgia	1,860	1,739	121	6.0
Georgia Southern & Fla	2,340	1,985	355	15.0
Gulf, Mobile & Northern	1,755	1,717	38	2.0
Gulf & Ship Island	1,446	1,446	0	0.0
Illinois Central	67,847	66,240	1,607	2.0
Louisville & Nashville	54,749	53,717	1,032	1.8
Louisville & H. & St. L	492	492	0	0.0
Mobile & Ohio	12,014	11,807	207	1.7
Nashville, C. & St. L	10,287	9,502	785	7.0
New Orleans Gt. North	1,453	1,245	208	14.3
Norfolk Southern	3,602	3,102	500	13.4
Richmond, Fred. & Pot	936	893	43	4.6
Seaboard Air Line	17,187	16,908	279	1.6
Southern Railway	68,113	67,280	833	1.2
Tennessee Central	388	296	92	18.0
Georgia & Florida	491	463	28	5.0
TOTAL	299,166	290,497	8,669	2.9

STATEMENT OF FREIGHT CARS EQUIPPED AND PEMAINING TO BE EQUIPPED WITH SAFETY APPLIANCES AS OF MARCH 31, 1919
CENTRAL WESTERN REGION

Railroads	Total Freight Cars Owned	Equipped with Safety Appliances	Remaining to be Equipped	Per cent of Cars Owned Remaining to be Equipped
Arizona Eastern	171	161	10	6.0
Atchison, Top. & Santa Fe	69,424	67,224	2,200	3.6
Chicago & Alton	13,070	12,606	464	3.4
Chi., Burlington & Quincy	70,242	70,116	124	1.6
Chi. & Eastern Illinois	24,385	22,404	1,981	8.1
Chi., Peoria & St. Louis	1,691	1,541	150	7.9
Chi., Rock Island & Pac	45,246	44,087	1,159	2.4
Chi., Terra Haute & S. E	6,892	6,642	250	3.6
Colorado Southern	6,896	6,639	257	3.4
Denver & Rio Grande	17,193	16,716	477	2.6
Denver & Salt Lake	1,121	996	125	9.7
El Paso Southwestern	4,258	4,235	23	0.5
Los Angeles & Salt Lake	5,273	5,257	16	0.3
Northwestern Pacific	1,304	1,304	0	0.0
Oregon Short Line	13,915	13,779	136	1.0
Toledo, Peoria & Western	1,799	1,725	74	4.1
Union Pacific	23,436	22,932	504	2.0
Wabash	17,862	17,373	489	2.6
Western Pacific	5,293	5,061	232	4.3
Ft. Worth & Denver City	3,951	3,528	423	10.5
Gilmor & Pittsburgh	207	48	159	66.0
Peoria Ry. Terminal	49	48	1	22.2
P. & P. U	227	218	9	3.9
St. J. & G. I	512	502	10	1.8
Wichita Valley	140	84	56	40.6
D. R. I. & N	122	122	0	0.0
Des Moines Union	18	18	0	0.0
Ilinois Terminal	84	84	0	0.0
Rapid City, Black Hills & Western	10	10	0	0.0
TOTAL	334,791	325,462	9,329	2.8

STATEMENT OF FREIGHT CARS EQUIPPED AND REMAINING TO BE EQUIPPED WITH SAFETY APPLIANCES AS OF MARCH 31, 1919
SOUTHWESTERN REGION

Railroads	Total Freight Cars Owned	Equipped with Safety Appliances	Remaining to be Equipped	Per cent of Cars Owned Remaining to be Equipped
Fort Worth & Rio Grande	0	0	0	0.0
Gulf Colorado & Santa Fe	762	757	5	0.7
Gulf Coast Lines	3,670	3,308	362	9.9
Internl. & Great Northern	5,484	5,162	322	5.9
Kansas City Southern	5,091	4,688	403	7.9
Kan. City, Mex. & Orient	1,638	1,501	137	8.4
Louisiana & Arkansas	1,161	1,161	0	0.0
Midland Valley	1,720	1,665	55	3.2
Missouri, Kansas & Texas	21,889	20,020	1,869	8.5
Missouri & N. Arksansas	715	637	78	10.9
Missouri Pacific	45,443	45,313	130	0.3
San Antonio & Ark. Pass	2,587	2,340	247	9.5
Missouri, Okl. & Gulf	1,304	854	450	34.5
Southern Pacific	16,975	16,053	922	5.4
St. Louis, San Francisco	30,912	28,422	2,490	8.1
St. Louis, Southwestern	13,900	13,304	596	4.3
Texas & Pacific	10,255	9,811	444	4.3
Vicksburg, Shreveport & Pacific	946	860	86	9.1
Arkansas Central	34	34	0	0.0
Memphis, Dallas & Gulf	118	103	15	12.7
St. Louis, San Fran. & Texas	73	68	5	6.8
Kansas City, Clinton & Sprinfield	43	38	5	11.6
Quanah, Acme & Pacific	60	52	8	13.3
Galveston, Houston & Henderson	55	53	2	3.6
Houston & Brazos Valley	20	2	18	90.0
Weatherford, Mineral Wells & N. W	11	11	0	0.0
Gulf, Texas & Western	88	79	9	10.2
Texas, Midland	206	206	0	0.0
San Antonio, Uvalde & Gulf	128	56	72	56.3
Trinity & Brazos Valley	1,482	872	610	41.2
Terminal R. R. Asso. of St. L	113	113	0	0.0
St. Louis Merch. Bridge Term	16	16	0	0.0
East St. Louis Connecting	12	12	0	0.0
St. Louis Transfer	9	9	0	0.0
Alton & Southern	311	168	143	46.0
Litchfield & Madison	1.053	873	180	17.1
TOTAL	168,284	158,821	9,663	5.7

STATEMENT OF FREIGHT CARS EQUIPPED AND REMAINING TO BE EQUIPPED WITH SAFETY APPLIANCES AS OF MARCH 31, 1919
NORTHWESTERN REGION

Railroads	Total Freight Cars Owned	Equipped with Safety Appliances	Remaining to be Equipped	Per cent of Cars Owned Remaining to be Equipped
Chi. Great Western	10,360	9,642	718	7.8
Chi., Mil. & St. Paul	64,361	55,597	8,764	13.6
Chi. & Northwestern	73,940	73,340	600	0.8
Chi., St. Paul, Minn. & Omaha	13,419	13,016	403	3.0
Duluth & Iron Range	7,151	7,151	0	0.0
Duluth, Miss. & Northern	9,350	9,323	27	0.3
Duluth, S. S. & Atl	2,875	2,760	115	4.0

Railroads	Total Freight Cars Owned	Equipped with Safety Appliances	Remaining to be Equipped	Per cent of Cars Owned Remaining to be Equipped
Elgin, Joliet & Eastern..	11,284	11,084	200	1.8
Great Northern	58,452	57,992	460	0.8
Mineral Range	1,024	995	29	2.8
Minn. & St. Louis.....	8,990	7,595	1,395	15.5
Minn., St. Paul & S. S. Marie	25,088	25,052	38	0.14
Northern Pacific	53,400	51,799	1,601	2.9
Oregon, Washington R. R. & Nav. Co.....	7,677	7,495	182	2.4
Southern Pacific	35,486	34,645	841	2.3
Spokane, Portl'd & Seattle	819	819	0	0.0
Ontonagon	90	2	88	97.0
Escanaba & Lake Sup...	417	417	0	0.0
Bolt	278	278	0	0.0
Chi. & Western Indiana.	648	648	0	0.0
Chicago Junction	284	284	0	0.0
Chi., Milwaukee & Gary.	269	195	74	27.5
Ft. Dodge, DesMoines & Southern	2,427	2,080	347	14.3
Green Bay & Western..	1,250	1,172	78	6.2
Indiana Harbor Belt....	41	31	10	24.0
Manistique & Lake Sup.	203	188	15	7.3
Copper Range	626	626	0	0.0
Chicago River & Indiana.	51	5	46	90.0
Fairchild & Northeastern.	20	20	0	0.0
Pacific Coast	518	518	0	0.0
St. Paul Bridge & Terminal	8	8	0	0.0
Waterloo, Cedar Falls & Northern	143	143	0	0.0
TOTAL	390,949	374,900	16,049	4.1

The report is signed by C. E. Chambers (Chairman), U. S. R. A.; D. R. MacBain, New York Central; C. E. Fuller, Union Pacific; C. B. Young, U. S. R. A.; H. Bartlett, Boston & Maine; E. A. Sweeley, Seaboard Air Line; H. T. Bently, Chicago & North Western.

Discussion

Mr. Brazier: It is very clear that the law defines that after September 1, 1919, no cars shall be received in interchange unless so equipped. You have had plenty of notice, and I would like to give you a few facts on the road which I represent. I thought that under government control all cars were home wherever they were, and I have treated them as such, but I find this is not a fact. The New York Central has equipped, in the last two years, between 500 and 600 foreign cars with safety appliances, and less than 10 cars of the New York Central have been equipped on the foreign lines. Our cars are somewhere in this country, and we would be pleased to have you put safety appliances on them so we can live up to the law. Under Federal control no cars are to be received after September 1, 1919, unless they are equipped with safety appliances. That means you must hold the cars on your lines and equip them before they are offered in interchange.

Mr. Tollerton: What Mr. Brazier has said is true. However, it seems from this report that the number of cars still unequipped with safety appliances is very small. We have all had a vast number of foreign cars on our lines during the past year and a half. There is an effort now being made to get the cars home. Our line has provided special material for equipping cars with safety appliances and I think many of the other railroads have provided the same thing. If the rule is provided that before September 1st these cars on foreign lines must be equipped with safety appliances, it will leave the individual lines with a lot of material they cannot use.

As the number of cars still uneqipped is so small, I believe it will put an unnecessary burden on the railroads to insist on the observance of September 1st as the date when cars shall be refused in interchange if they are not equippd with the safety appliances.

The time should be extended, to give time for these cars to get home, so that the individual lines can equip them with the material they have on hand. I offer a resolution at this convention, that we go on record as asking the Interstate Commerce Commission to extend the time for the application of the safety appliances until January 1, 1921, instead of September 1st of this year.

Chairman: I will put the original motion made by Mr. Fuller to accept this report before we take further action.

The motion was put to vote and carried.

Mr. Brazier: I will second the resolution made by Mr. Tollerton. The material Mr. Tollerton speaks of is standard, and the roads are equipping the cars with this standard material. We do not care about the safety appliances put on our equipment as long as they comply with the Federal laws.

I think it is in the hands of the government to say whether they will extend the time, or insist on our having the equipment provided with the safety appliances by September 1, 1919. I would like to see all the cars equipped. The equipment is standard to our cars and will be in the nature of repair work in the future.

C. E. Fuller (U. P.): If we could get the cars home we would do the work. There never was a time so opportune, nor a power so strong, as exists today that can get the cars home. I would like to see something go on the record to the effect that the movement of foreign cars to the home line shall be put into operation immediately. We received some cars recently that had not been on our line in 12 years. They were not equipped with safety appliances, or very much of anything else when they got home. I think that if this Association would go on record as asking the director general of railroads to make some rule—although there is a rule now in force to that effect—to have the cars returned home, and have this made absolutely effective, this question can be handled very easily and expeditiously.

T. H. Goodnow (C. & N. W.): In connecion with the motion made by Mr. Tollerton, I was going to say that all railroads have undertaken to equip a great many cars in the last 18 months, which it was never anticipated would be equipped. We had a retiring schedule lined up, with several thousand cars on that schedule, which, had it not been for the conditions caused by the war, would have been retired by this time. They were old, light capacity cars, but instead of retiring them we withdrew the schedule and have been repairing the cars, so that in a way accounts for a number of cars in the country at the present time that remain unequipped.

So that there will be as little interference as possible in the interchange of cars when the law becomes effective, it will be necessary to see that th intrchange inspectors are educated. While the United States standards are alike, their manner of application has not been the same on account of the construction of cars, and if inspectors are not educated, undoubtedly there will be cars rejected or refused that should be accepted, and others accepted that possibly should not be.

Mr. Gaines: I think this a very opportune time to request the Railroad Administration to make it imperative to send them home. While there is a rule out to send foreign cars home as rapidly as possible, it could be made imperative to send such cars home as are not equipped with safety appliances, and I think if that were done the majority of roads can get the cars home in time to put the safety appliances on in the near future. I don't know whether they could do it all by September 1 or not, but they could do a great many of them.

Mr. McManamy: So that we won't misunderstand the attitude of the Railroad Administration, I will say that rules are in existence for sending foreign cars home as needed for general repairs, or for betterments. I don't think there is anyone in this convention that would seriously ask the Railroad Administration to send empty cars long distances home to have ladders, handholds, hand brakes, or standard running boards, put on them. We have to consider the empty car mileage in that connection, and if we send cars four or five hundred or a thousand miles, for the application of such minor appliances, the actual cost of movement of the empty car will be several times the cost of the repairs. The Railroad Administration is trying to use judgment in the matter of sending cars home for repairs of any kind, realizing all the time that as a general proposition, heavy repairs or the application of betterments, can be better and more satisfactorily performed on the home line.

That is the principle that the Railroad Administration is fol-

lowing. But I am quite sure that this convention would not want to go on record as asking for cars to be sent home for the application, for instance, of the additional sill steps required by the law, or for the application of additional ladders or for the standardization of hand brakes. Where the safety appliances required mean practically the rebuilding of the car, every road has it in its own hands to have a car sent home by applying for it. If a request from any road is made to the Railroad Administration that such cars be sent home for extensive repairs or the application of betterments, orders are issued through the Car Service Section to send the car home, and you get them as fast as may be necessary—as fast as you can handle them.

We have had to regulate the sending of cars home because some roads were being buried in bad order cars, which other roads were sending home without request. Those things have to be handled in a broad way. We have at present, if I recall correctly, about 89,000 cars that are not yet equipped with U. S. safety appliance standards. During the last year we have equipped about 11,000. The time is not long, and in many instances the work is not very heavy, but there is not a railroad shop in the country that cannot put the standard safety appliances on any car just about as cheaply as they can be applied at home, with the exception of changing the superstructure of the car to give necessary end ladder clearance. The other things can be standardized much more quickly, and just as satisfactorily by any line and at any shop, as they can at home, and we will save a great deal of extra empty car mileage in that way.

It may be possible that it will be found desirable to ask the Interstate Commerce Commission for an extension of time, but we must remember that the Commission has been frequently asked for extensions of time on this matter, and I think we will all agree that it has been very fair and even liberal in the granting of such extensions when the need for them could be shown. I think this convention should take some action which would expedite the application of Federal safety appliance standards wherever the car happens to be.

I think we will find this: A large proportion of these 89,000 cars that remain yet to be equipped are special service cars, outfit cars, and other cars that are not largely used in interstate traffic, and if we take those away from the total, it will reduce the number to be equipped at foreign shops very materially. I simply want to lay before the convention the situation as we see it at Washington. We are sending home cars on request, not otherwise, except where cars are offered to the owning line at interchange point, when all empty cars must be accepted.

But I don't believe the convention wants to go on record as asking for excessive empty car mileage to get these cars home, when most of them can be just as well equipped at any other shop.

Chairman: I am thoroughly in accord with what Mr. McManamy has said. It would cost five times as much to get some cars home as it would cost to equip them. One thing I think is really important: Each mechanical department man on a railroad knows the attitude of his corporate interests as to what cars are to be maintained. I know that quite a number of cars remain on foreign lines today that are not equipped because they are of the oldest type, and in all probability they don't expect to maintain the cars. I favor a resolution from this convention that each road, so far as possible, learn the location of such cars and notify that road that it is not intending to maintain them. In that way, they would prevent any further money being spent. I would like to see an extension asked, for the end ladder clearance. They are cars that will be maintained for many years, and you might be able to get some extension to that particular portion of the requirements.

Mr. Fuller: I want to correct a misunderstanding. It was not my thought to move cars light, but to load them to home lnie. I full appreciate the fact that there are a lot of cars in this country that will not be equipped, and also appreciate that there are a lot of outfit cars in this list. If the real list of the cars that are to be maintained was under consideration, or given, it would reduce that number considerably. I don't see any reason why the Central Railroad of New Jersey, if it has a modern car belonging to a Western road, could not just as well load that car to the West as to load some other car.

Chairman: I think that all roads are so instructed at the present time, and should make it a point to load a foreign car. But most of these cars are cars that cannot be loaded until something is done to them.

Mr. McManamy: I think W. P. Borland, the Chief of the Bureau of Safety, is in the audience somewhere, and I suggest that he be asked to explain to the convention just what the provisions are with respect to reconstructing cars to give them the desired end ladder clearance. I think that provision is covered in the Federal orders as they now stand, but he is more familiar with that than I am.

W. P. Borland: The motion made by Mr. Tollerton is one that the Commission will not look on very favorably. The Commission has already extended the time for the equipment of these cars on four different occasions, and I am sure they will not favor any further extension of time.

It seems to me that a great proportion of these cars that are still to be equipped are cars that naturally would be retired from service, and as to those that are still to remain in service, I cannot see any reason why they should not be equipped wherever they are found just as easily as sending them home.

I noticed in the list which was read two roads which in 1915 reported they had no cars to equip. One of them has reported here that they have 3.1 per cent and the other one another percentage which I cannot recall. When some of the roads were asking the Commission for further extension of time, those two roads stated that they wanted no further extension of time, because they were fully equipped.

I cannot see any particular reason—with the Railroad Administration able to get these cars fixed wherever they may be found—for another extension of time. The material is standard and can be used at any time and anywhere, and I cannot see that there is any hardship placed on the roads.

Chairman: There is some special provision in regard to the end ladder clearance, is there not?

Mr. Borland: Yes, but I cannot recall that. I cannot state it specifically without the order before me.

H. W. Watkins (So. P.): I favor Mr. Tollerton's motion for an extension of time, because I think it is necessary. It has been stated here that only 11,000 cars were done during the past year. How are we expected to do 89,000 cars in two months? Let us have the time that is asked for, and I believe by that time the railroads will be in a better position, and will have the job completed.

J. J. Tatum (U. S. R. A.): The safety appliance parts that we have in stock on the various railroads of this country to apply to cars belonging to the individual roads are United States standard Safety dimensions and meet the requirements of the law. If they did not meet these requirements, you would not apply them to the cars. For that reason they are suitable to apply to the cars of any railroad, and will meet the requirements of the law if properly applied. I see no reason why we should send a good order car home to have safety appliances applied to it. If you have safety appliances on your railroad, apply them to your own cars, apply them to your neighbors' cars, let your neighbors apply their safety appliances to your cars and we will get the safety appliances applied promptly.

As to the number of cars being equipped with safety appliances during the Federal control, we must all bear in mind that the men of our individual railroads were beyond the sea, applying safety appliances to the Germans. They did it well, and now that a great many of them are back with us and more coming, we can apply safety appliances to our cars very quickly.

Mr. McManamy said that we had equipped 11,000 cars during Federal control. Probably this figure slipped him in some way or another, but as a matter of fact, we applied 29,788—almost three times that number.

F. F. Gaines (U. S. R. R. A.): It would seem from what has been said here this morning, that it is a very easy matter to apply safety appliances anywhere at any time. It may be on some roads, and on some cars, but my experience as far as the end ladder clearance goes, it is not anything of the kind. On a great many of the cars it means new draft timbers, new end sills, and a lot of other things. It can not be done cheaply. If the end ladder clearance was excepted from all the other things, we could get busy with it without any trouble—we could put on the grab irons, and ladders, and all the other things that are required, but it will be a very difficult matter to apply the end ladder clearance, as far as the coupler is concerned, on old cars cheaply.

Mr. Tatum: I do not think we can tear down the cars and rebuild them to get the end ladder clearance to meet the requirements of the law as promptly as we would like to do, but by changing the coupler and using the long head coupler, we can put in the end ladder clearance almost in the same time that we are applying the ladders and grab irons. I do not believe we can do all this work by September 1, but we can facilitate the application of the appliances and get a greater number of cars equipped in a shorter time than we have been able to do in the past.

Mr. McManamy: I want to thank Mr. Tatum for correcting my figures. Roughly speaking, the provision for end ladder clearance in the requirements of the law, is that where cars have 10 in. or more clearance, they may be operated during the life of the car. Where they have less than that, they are supposed to be in a dangerous condition and the repairs should be made.

Mr. Tatum is correct when he says that in practically all cases, or in many cases, that the end ladder clearance is given by applying a coupler with a special head, so that with the provision which is now contained in the law, making exceptions of cars with more than 10 inches end ladder clearance. I do not believe that phase of the question is as serious as it appears.

Mr. Borland: I am quite sure that Mr. McManamy is correct on that. I will have the order in a few minutes and will let you know exactly how it reads.

I. S. Downing (C., C., C. & St. L.): Our great difficulty has been in getting the cars to the repair tracks. We had equipped a large number of foreign cars with safety appliances. The trouble is that at the large terminals, where you can equip them, the car comes to you loaded. It is loaded to an intermediate point, when it is unloaded, and reloaded again, so that the inspectors do not get at them and they go on through.

To get them to the repair tracks, I believe some kind of a general car could be used, to the effect that if the car is found without the safety appliance, and is loaded, it should be shipped, when it is unloaded, to the nearest shop in order that the appliances may be applied.

The ladders and end holds are near the proper location on a great many of the cars, so that unless the inspectors stop to measure them, they do not know that they do not comply with the law, and they are pased along. In order to get these cars to the shop, when they are received loaded, and the safety appliances must be applied to the car, we must indicate on the car in some manner that when it is unloaded it must go to the nearest shop for having the appliances applied, regardless of the road it is on.

We get long lists from other roads, telling us that certain classes of cars are not equipped. The inspectors have so much to look after and so many reports to make that they pay but little attention to these lists of numbers. About two weeks ago. I thought I would put some special men in our large terminals for a test, and I put these men at Indianapolis, Cincinnati, St. Louis and Cleveland, and we did not find a Big Four car in any of these yards not equipped. We found several foreign cars not equipped, but they were loaded cars, loaded off our line. We had no right to pull them to some other shop, but I do believe that a very simple card could be gotten up that we could apply to the car, to the effect when the car is not equipped with the safety appliances that when it is unloaded it should be sent to the nearest shop to have the safety appliances applied.

Mr. Gaines: The main objection to the present status of the proposition is the end ladder clearance, and I feel that we could very justly ask the Interstate Commerce Commission to give us an extension of time on that one item. I would, therefore, move that this convention make that request to the Interstate Commerce Commission as an amendment to the motion now pending before the house.

J. S. Naery (C. I. & L.): Most of the cars we have to-day running over the country are cars that only need the replacement of the coupler. If we had the material to make this change, we could equip the cars. I have no doubt there are many other roads in the same condition. We started out to equip our wooden cars with the long draft arms, but you all know that previous to the war everybody wanted this material and it could not be furnished. We use the long shank couplers, but could not get them, and when the extension came along, it gave us the privilege of running the cars. Today we cannot get the long shank couplers, and that is one condition which should be looked into in regard to the end ladder clearance. I put the appliances on individual cars, including the coupler, and if there is anything that can be done to help the situation in regard to this end ladder clearance it should be done.

E. T. Millar (B. & M.): I was very much impressed by what Mr. Brazier said regarding the number of cars that his road had equipped. Some two years ago I appointed myself a committee of one to do what I could to accomplish the end in view and get all our cars equipped. I presume the figures read, as far as the Boston & Maine is concerned, were correct—one-tenth of one per cent. Before coming to the convention I cleaned up all the matter I had on my desk, and I found that we had a total of 28 cars to equip, four of which would come under Form RE 2.

In the last month we equipped 64 foregin cars on the Boston & Maine, and I have so reported to the mechanical head. I also advised him that a proper billing statement would be sent through the Accounting Department, and sent a copy of that to our Accounting Department. I have had a number of inquiries from different mechanical men regarding their cars, and to the best of my ability I have run them down, and shopped them. In many instances I have found that their cars were equipped, and that, through some error in reporting, they had not been checked off on their books. I found that is true also as far as the Boston & Maine cars are concerned. I next checked up our own cars. I found there had been errors made and cars were not reported, or the reports had been lost, as all the reports were handled through the U. S. R. R. mail.

I agree with Mr. Fuller in regard to loading cars in the direction of the home road. I thoroughly believe in that. I sent out three tracing letters on a car which was passing over our lines. The car was owned away down in the South. It was loaded in the Middle West, and destined to a point about as far East as cars run. I know positively that where that car is to be unloaded it is utterly impossible for those people to equip it.

Motion Withdrawn

At this point the original motion was withdrawn by Mr. Tollerton in favor of the amendment which covered only a request for an extension on the end ladder clearance. This motion was put to a vote and unanimously carried.

Mr. Borland: If you will permit me to proceed a little out of order now. I was unable to quote this exactly, and I did not want to say anything until I was sure I was exactly right. With respect to the steel and steel underframe cars, the roads have a definite extension, in which to provide for any change in these end ladders on these cars until the safety appliances are renewed. I suppose you all understand that.

Now, with respect to paragraph D, the carriers are not required to make a change to secure additional end ladder clearance on a car, that has more than 10 in. end ladder clearance within 30 in. of side of car, until the car is shopped for work amounting to practically rebuilding body of car, at which time they must be made to comply with the standards prescribed in the order. That cuts you down to paragraph E, which refers to cars which have less than 10 in. end ladder clearance. Those are the only ones that you need bother about to any great extent. Paragraph E refers to cars with less than 10 in. end ladder clearance, which must be changed at once. The original order gives five years, and as you know, there has been four different extensions on that, or three since the original order was passed, and as I said before, I don't believe the Commission will look very favorably upon any request for further extension of time, and it don't seem to me it is required.

Mr. Harvey: I would like to ask whether the 10 in. clearance refers to all cars, or simply the cars built prior to July 1, 1911? My understanding was that on cars built after July 1, 1911, it was necessary to have the 12 in. clearance.

Mr. Borland: That is true. It refers to cars built prior to July 1, 1911.

Mr. Harvey: When that law went into effect there was a great many cars under contract. Some of the cars were delivered, say, June 30th, and the 10 in. clearance was permissible. Cars delivered July 1, have to be changed, according to my understanding. That accounts for about half of our cars that are not equipped.

Report of the Standing Committee on Loading Rules

J. J. Eurch
Chairman

The Committee Received some correspondence from C. R. Gray, director, Division of Operation, United States Railroad Administration, instructing that the Code of Loading Rules be rearranged so that all instructions relating to each class of lading would be fully covered under the specific heading referring to such lading, thereby eliminating as far as practicable all cross references. The rearranging of the Code of Loading Rules will now meet these requirements. The general rules comes first in the code and are intended as a guide to the shipper in securing lading on the car, which is not specifically or definitely covered. Following this appear in their order the specific rules covering the manner of securing on cars the more common class of lading. The rules covering any specific lading referred to in the code, may, if desired, be obtained from the secretary, in pamphlet form, thereby eliminating in many cases the unnecessary expense of buying the complete Code of Loading Rules.

In addition to rearranging the rules, the committee reproduced all cuts to a larger scale and made the lettering and figures uniform in size and more legible. After the loading rules were put in their final shape, they were submitted to and approved by the Assistant Director of Operation, United States Railroad Administration, and the Executive Committee of the M. C. B. Association.

The committee has received a number of recommendations and suggestions from the Regional Directors, the Car Service Section of United States Railroad Administration, and others, relative to new rules to cover lading not taken care of in the present Code of Loading Rules and changes in the present rules. The suggestions in the main have reference to the conservation of the car supply by increasing the load carried per car and revising the present rules to bring them up to approved practices.

On account of the apparent necessity that immediate action be taken, the committee prepared several new rules and revised others, sending them to the Executive Committee for approval. The new rules, and the rules which have been revised and issued as supplements to the 1917 Code of Loading Rules by the Executive Committee, are as follows: Supplement Circular No. 6, issued July 15, 1918, includes a modification of Rules 17, 56, 57 and 59 and the following new rules: Rule 88, Manner of Loading Metal Plates in Gondola Cars; Rule 112C, Manner of Loading Wrought-Iron Pipe 12 in. or Less, on Flat Cars; Rule 117B, Manner of Securing Concrete Culvert Pipe Loaded on Flat Cars, and Rule 135, Manner of Loading Metal Sheets in Box Cars.

Supplement Circular No. 11 issued July 25, 1918, contains a modification of Rule 121-B, 1917 Loading Rules, Loading of Gasoline Tractor Engines.

These modifications and additions were incorporated in the rules as revised for 1918.

Proposed Changes in the Loading Rules.

The committee recommends the following changes in and additions to the present (1918) Code of Loading Rules:

Wide Plates Loaded Diagonally on Gondola Cars

Page 89, Paragraph 513.—Change marginal note to "Plates loaded diagonally on gondola cars having wooden side boards."

Page 89, Paragraph 513.—Change second sentence to read "The plates must be placed on the car so that the center of gravity of the load (center line of plates) will be in the longitudinal center line of the car, if necessary filler pieces may be placed between post and side boards to accomplish this."

Page 89, Paragraph 513.—Change sentence beginning "When used, the size of bearing-pieces is optional," to read "When used, the size of bearing-pieces is optional, but they must be located opposite each post and longitudinal shifting of the plates prevented by either stop blocks spiked to side and floor of the car or by horizontal tie rods across car."

Round Plates, Flat or Flanged

Page 90, Paragraph 513.—Change the last sentence "blocks securely spiked each edge of the plates" to read "To prevent longitudinal shifting, stop blocks 6 in. by 8 in. must be either bolted to the floor of the car or secured by cleats spiked to the sides and floor of the car."

Page 90, Paragraph 514.—Revise as follows: "Gondola cars loaded with plates or other material on the floor of the car may have plates that are too wide for the car, loaded on top of the car sides when the height of the sides does not exceed three feet (See Fig. 38-D.) Such superimposed plates must be supported by posts, one set of posts for each length of lading with a minimum of three sets of posts for each tier of plates. Side motion to be prevented by not less than two clamps consisting of a clamping-piece secured through the side boards of the car by an angle rod, the vertical leg passing through the clamping-piece and the horizontal leg through the side board of the car. Longitudinal motion to be prevented by struts against the end of the lading and spiked or bolted to the side of the car."

Page 102, Paragraph 527.—Revise to read "When bearing-pieces are on the ear floor they must be over the car bolster or between bolsters. When one or both bearing-pieces are located on top of the car sides, they may be placed within twelve inches of either side of the center line of the car bolsters.

Page 120, Paragraph 555.—Revise to read as follows: "Material loaded on gondola cars with drop ends or on flat cars, as shown in Figs. 55 and 56, must have one hardwood bearing-piece not less than 10 in. by 10 in. for loads up to 65,000 lb. per bearing-piece and not less than 12 in. by 12 in. for loads exceeding 65,000 lb. per bearing-piece (see paragraph 507 for light loads), secured to the floor of each car with ⅞ in. bolts."

Paragraph 555-A.—When the lading consists of I-beams or similar material lying flat, and the load is 40,000 lb. or more per bearing-piece, or where there is danger of the flanges cutting into the bearing-piece, the webs must be supported by web-pieces or the lading must be placed on pivoted bolsters. (See Fig. 42.)

Paragraph 555-B. In placing lading on cars the following general requirements should be followed. (a) Make the width of the load as great as possible consistent with side clearance; (b) the longest pieces must be placed at the bottom of the load and, when possible, near the center of the pile; (c) When the lading consists of different kinds of material such as I-beams and angles, spacing blocks not less than 2 in. by 8 in. in section placed over and in line with the bearing-pieces may be used between the various kinds of material to properly align and stabilize the load. (See Fig. 42); (d) All structural material should be interlaced as far as practicable to prevent independent side motion; (e) The various tiers of the lading must be moved close together. Where space is left between tiers it must be filled up with upright spacers located at the bearing-pieces and binders so as to make a compact load when the binders are drawn tight. These spacing pieces must be secured at the top against falling out; (f) Height of the load is to be measured from the top of the bearing-piece to the top of the load; (g) Loads are limited to six feet in height and 180,000 lb. on the two bearing-pieces.

Paragraph 555-C. A clamp consisting of a hardwood top clamping-piece 6 in. by 8 in. in section and two vertical rods 1¼ in. in diameter placed close to the load and passing through the clamping-piece, the bearing-piece and the floor of the car shall be applied at each bearing-piece as shown in

Fig. 42. Each end of the clamping-piece shall have a ½ in. bolt with a suitable washed under the head and a nut to prevent the clamping-piece from splitting. If the load is 24 in. in height or over, braces 4 in. by 6 in. for loads up to 5 ft. in height and 6 in. by 8 in. for loads 5 ft. and not over 6 ft. in height must be added as shown in Fig. 46. The batter of the brace should be as great as possible. The clamping-piece at the top of the load should just clear the load when braces are used.

Paragraph 555-D. Binders consisting of two vertical hardwood pieces of timber 6 in. by 8 in. in section with ½ in. bolts and a suitable washer under the head and a nut in each end to prevent splitting, drawn together by means of two 1¼ in. rods, one on top and one below the load, shall be applied to all loads as follows: Loads up to 4 ft. in height, one binder located midway between bearing pieces. Loads 4 ft. and up to 5 ft. in height, two binders, one adjacent to each bearing-piece (either side) and 6 in. from it. Loads 5 ft. and not over 6 ft. in height, three binders, one adjacent to each bearing-piece and one midway between bearing-pieces.

Page 120, Paragraph 556.—The following notes should be added.

NOTE 1.—The side clearance given in paragraph 556 for a triple load relates to a load on three cars with the bearing-pieces located on the first and third cars and the center car acting as an idler.

NOTE 2.—A twin load supported on bearing-pieces on the first and second cars with the overhanging load over the third car, either with or without sliding-pieces on the third car, should be treated as a twin load for side clearance. The overhang governs the width of the load according to the tables under paragraph 554. The clearance required on each side of the overhang is one-half the difference between the width given in the table and ten feet.

Paragraph 558.—Change the reference to Fig. 47 in the second line of this rule to read: *Fig. 48.*

BEARING-PIECES TO BE PROVIDED WITH VERTICAL RODS AND CLAMPING-PIECES

Paragraph 559. Revised to read: "The bearing-pieces only are to be provided with vertical rods and clamping-pieces. When the bearing-piece is located on top sides of gondola cars it must be secured by cross braces and diagonal struts, as shown in Figs. 49, 50 and 54, to prevent breaking down of the sides of the car when going around curves. When the load, measured from top of bearing-piece to top of load, exceeds 24 in. in height the bracing for the clamping-piece on top of the load must be as shown in Fig. 46."

CENTER-POSTS AND BEARING-PIECE CROSS BRACES MAY BE OMITTED

Paragraph 560. Revised to read: "For twin load of plates, structural bars and shapes carried on two bearing-pieces not less than 8 in. by 10 in. in section (with or without sliding-pieces) located on top sides of car, the center post and bearing-piece cross braces may be omitted if the total weight of lading does not exceed 20,000 lb. or 10,000 lb. per bearing-piece.

Rule Governing Loading of Automobiles, Trucks and Trailers on Freight Cars

1300. Cars must be carefully examined, all defects remedied, and must be properly cambered.

1301. Cars should be in such condition that the trucks can curve freely. The maximum side-bearing clearance for loaded cars must not be more than 5/16 in. per side-bearing for loads less than 10 ft. high from top of rail, and must not exceed 3/16 in. per side-bearing for loads 10 ft. high or over from top of rail.

1302. All single cars must be so loaded that one hand brake is accessible and operative. There must be a clearance of at least six inches between the brake wheel and the lading, this clearance to extend the width of the car.

1303. The lading must be so placed on the car that there will not be more weight on one side of the car than on the other.

1304. The height and width of lading must be governed by the clearance limits of the roads over which the lading is to pass.

1305. All clamping-pieces, bearing-pieces, braces and blocks must be sound, straight-grained lumber (hardwood preferred) and free from knots that materially impair their strength, or may be rolled or built up steel sections of equal strength. Decking or staging may be of lumber or steel construction.

1306. All trucks measuring more than 14 ft. over all should be loaded on open top railway freight cars, wherever

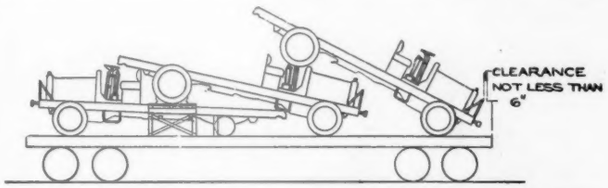


Fig. 99.—Tilting Method of Loading Three or More Automobile Trucks on Open Top Freight Cars

possible. Load freight cars as nearly as possible to capacity, using such of the methods given in the following specifications as will obtain the most economical results.

1307. Never load one vehicle, only, on a frieght car, when it is possible to avoid it. Two trucks each 22 ft. long can be

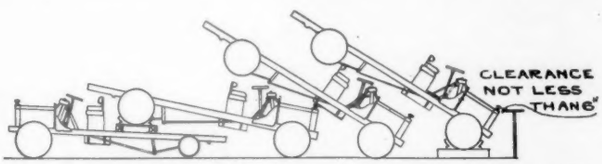


Fig. 99a.—Tilting Method of Loading Four or Five Automobile Trucks on Open Top Freight Car

loaded on 35 ft. freight car by tilting one of the trucks. Three trucks each 22 ft. long can be loaded on 40 ft. car by tilting two trucks. Four trucks each 22 ft. long can be loaded on a 45 ft. car by tilting three trucks. See Figs. 99, 99-A and 99-B. (When tilting, the wheels of either end of the vehicle may rest on the floor of the car, the other end raised.)

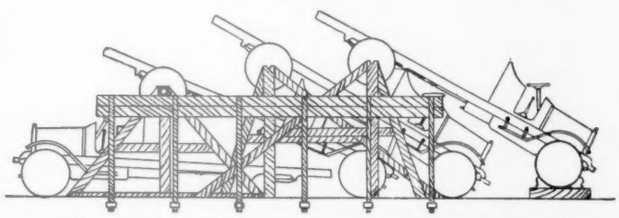


Fig. 99b.—Tilting Method of Loading Four or Five Automobile Trucks on Open Top Freight Car

1308. Where three trucks are to be loaded on a freight car which is long enough to hold two on the floor, back to back, the third truck can be loaded on top of the other two. This is done by fastening cross beams on the frames of each of the other two lower trucks with J- or U-bolts. Upon these

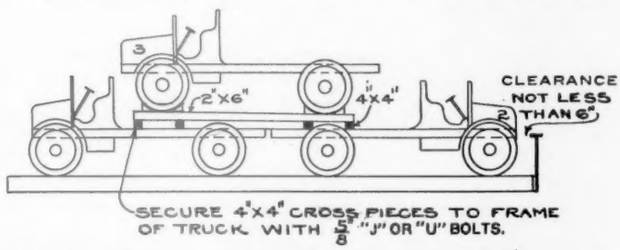


Fig. 99c.—Manner of Loading One Auto Truck on the Frames of the Two Trucks Loaded on the Floor of the Car

beams is mounted a board which will support the wheels of the third truck and the blocks that hold it. See Fig. 99-C.

1309. Where the over-all length of trucks being loaded is slightly greater than the length of the freight car, safe loading can be made by removing the front or rear wheels of

one of the trucks and slightly raising the rear of another truck so that it overlaps the end of the first truck. This is to prevent the truck from projecting beyond the end of the freight car.

1310. In the case of automobiles or light trucks having a wheel base not over 125 in. from four to five can be loaded on a freight car by tilting all but one. See Figs. 99-A and 99-B.

Methods of Loading

1311. There are three methods of loading and staying automobiles, trucks and trailers on freight cars: (a) blocking

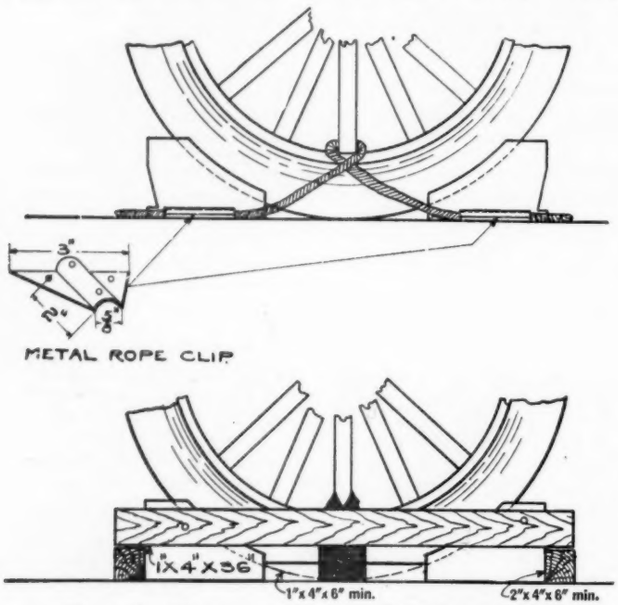


Fig. 100.—Manner of Securing Wheels to the Floor

or chocking on the floor of the car; (b) tilting (one end of the vehicle resting on the floor of the car, the other end raised; (c) double decking. These three methods are treated separately.

Blocking

1312. Lumber used in the construction of wheel blocks, side strips and heel blocks, must be sound (free from decay and dote) and no knot shall be permitted that interfers with the nailing.

1313. The principal woods used in blocking automobiles, trucks and trailers are, for the purpose of these specifications, divided into four groups as follows:

	Group No. 1.	
Virginia and Carolina Pine	Yellow Poplar	Buckeye
Cypress	Balsam Fir	White Fir
White Pine	Chestnut	Cedar
Norway Pine	Sugar Pine	Redwood
Aspen	Basswood	Butternut
Spruce	Willow	Cucumber
Western Yellow Pine	Magnolia	Apine Fir
Cottonwood	Noble Fir	Lodgepole Pine
	Group No. 2.	
Southern Yellow Pine	Douglas Fir	Larch (Tamarack)
	Group No. 3.	
White Elm	Pumpkin Ash	Tupelo
Red Gum	Black Ash	Maple, sofe or silver
Sycamore	Black Gum	
	Group No. 4.	
Hard Maple	Hackberry	White Ash
Beech	Birch	
Oak	Rock Elm	

Wherever wheel blocks are made from Group 1, side strips not less than 1 in. by 4 in. and heel blocks not less than 2 in. by 4 in. by 6 in. must be used as an additional reinforcement, regardless of the weight of the vehicle loaded.

1314. Side strips must be used on all plain faced blocks and grooved blocks that do not have incut or extended heels. Heel blocks must be used with all solid blocks that do not have incut or extended heel. (See Fig. 10.)

1315. Groups 2 and 3 will not require side strips as does Group 1.

1316. Wherever Group 4 is used for making wheel blocks, the heels and sides of the blocks must be bored to receive the nails.

1317. Wherever blocks in Group 1 are used in combination with blocks in other groups, these blocks shall be re-

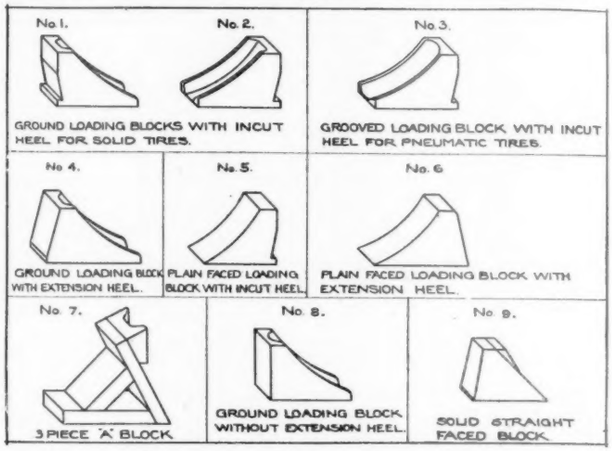
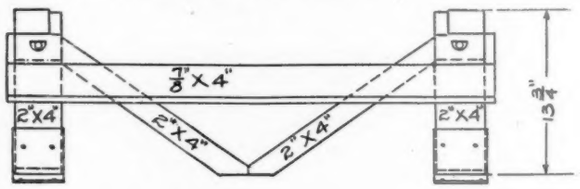

No. 1.
No. 2.
No. 3.
GROUND LOADING BLOCKS WITH INCUT HEEL FOR SOLID TIRES.
GROOVED LOADING BLOCK WITH INCUT HEEL FOR PNEUMATIC TIRES.
No. 4.
No. 5.
No. 6
GROUND LOADING BLOCK WITH EXTENSION HEEL.
PLAIN FACED LOADING BLOCK WITH INCUT HEEL.
PLAIN FACED LOADING BLOCK WITH EXTENSION HEEL.
No. 7.
No. 8.
No. 9.
3 PIECE "A" BLOCK.
GROUND LOADING BLOCK WITHOUT EXTENSION HEEL.
SOLID STRAIGHT FACED BLOCK.

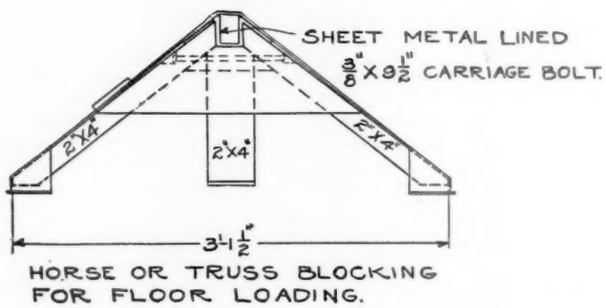
Fig. 100a.—Types of Heel Blocks

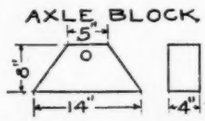
inforced with side strips and heel blocks as specified in paragraph 1313 on each wheel in which the combination occurs.

Wheel and Axle Blocks

1318. Any of the following blocks may be used: Curved grooved block with incut heel. Curved grooved block with-incut heel. Curved plain faced block with incut heel. Curved







THESE ARE MINIMUM DIMENSIONS. THE BASE MUST BE INCREASED IN PROPOTION TO THE INCREASE. IN HEIGHT.

Fig. 1001

plain faced block without incut heel. Solid plain faced block with or without incut heel. Three-piece A-block. (See Fig. 100-A for cuts of foregoing blocks.)

Axle Blocks (see Fig. 100-L).

V-block (see Fig. 100-M, for detail construction).

1319. (a) Where wheel blocks are used without incut heel, the back of the block must be extended so as to form an extended heel not less than 2 in. from a vertical line drawn from the back edge of the top of the block, or the block must be backed up with 2 in. by 4 in. blocks securely nailed to the floor of the car. (b) When solid axle blocks are used, they must be made from wood shown in Groups 2, 3 or 4 of paragraph 1313. (C) When the horse or truss method is used for floor loading the wood for construction must conform to paragraphs 1330, 1331 or 1332.

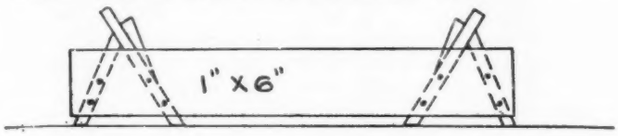
1320. Blocks must be one inch wider than the tire. Curved grooved blocks must be made so as to conform to the contour of the tire. For five ton trucks or heavier, increase the width of the block one inch and use one additional nail.

SIZE OF BLOCKS WITH INCUT OR EXTENDED HEELS

For tires to 30 in. in diameter..... 6 in. high by 10 in. long
For tires to 32 in. in dimaeter..... 7 in. high by 11 in. long
For tires to 34 in. in diameter..... 8 in. high by 12 in. long
For tires to 36 in. in diameter..... 9 in. high by 13 in. long
For tires to 40 in. in diameter.....10 in. high by 14 in. long

Where wheel blocks are used without incut or extended heel, add 2 in. to the above lengths.

1321. For tires seven inches wide or wider, use plain curved blocks. (See Fig. 100-A, Blocks No. 5 and No. 6.)



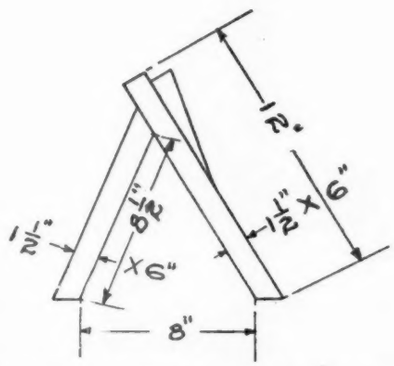


Fig 100m.—These are Minimum Dimensions. The Spread of the Block Must Not Exceed 90 deg.

1322. (a) When using the three-piece A-block or a straight faced solid block, a grooved or triangular shaped block should be fastened to the top so as to bring the resistance to the highest point of the block. (See Fig. 100-A, Blocks No. 7 and No. 9.) (B) In lieu of the foregoing, blocks as per Fig. 100-N may be used.

Loading Instructions for Automobiles, Trucks and Trailers

1323. (a) In raising vehicles for tilting or double-decking, the tackle should be secured by means of a hook or loop fastened to the side or end posts of the car. The tackle should not be fastened to the ridge pole or carlines.

(b) When a vehicle is loaded on the floor, chock all four wheels, using two wheel blocks to each tread, or solid axle blocks, or secure the front axle by two horses or truss blocks and tie the rear wheels securely to the floor, as per paragraphs 1324, 1325 or 1326.

(c) If a solid axle block is used, a 2 in. by 4 in., 24 in. long must be securely nailed to the block and to the floor of the car with not less than six 20-penny nails (cement-coated preferred). This 2 in. by 4 in. may be omitted in connection with the front axle blocks. A solid block 8 in. high must have a 14 in. base, and for higher blocks the base must be in proportion to the increase in height.

(d) If the horse or truss method is used, paragraph 1349 governs the manner of securing it to the floor of the car.

(e) If a solid block is employed, use not less than three 20-penny nails (cement-coated preferred) at the back and one 10-penny nail (cement-coated preferred) on the outer side. If side strips are used, the 10-penny nail on the outside may be omitted.

(f) If a three-piece A-block is employed, use not less than three 20-penny nails (cement-coated preferrd) at back and two on the end next to the tire, one on each side.

(g) With all solid grooved blocks having incut or extended heel made from Groups 2, 3 or 4 and when loading vehicles weighing 3,000 lb. or less, side strips are unnecessary.

(h) A-type blocks must be constructed so that the bottom board projects sufficiently far to the rear to act as a heel block.

(i) When loading, emergency brakes should be set.

(j) The distance between any two vehicles at the nearest points loaded on a freight car must not be less than 2 in. horizontally and 4 in. vertically.

1324. Each wheel must be tied to the floor with a strap and

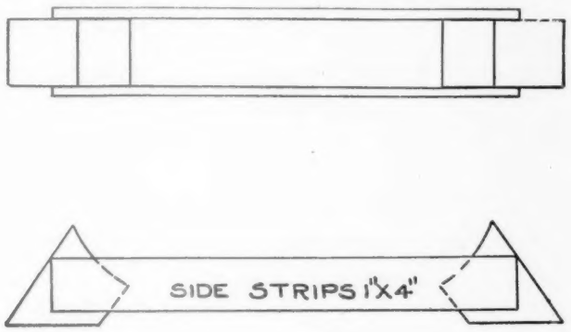


Fig. 100n

each strap must have an ultimate tensile strength equal to one-fourth the weight of the vehicle, for which purpose rope is recommended. (See Fig. 100.) The following table may be used for estimating the size of manilla or hemp rope to be used.

½ in. diameter.....2,450 lb. ultimate tensile strength
⅝ in. diameter.....4,000 lb. ultimate tensile strength
¾ in. diameter.....4,900 lb. ultimate tensile strength
⅞ in. diameter.....5,900 lb. ultimate tensile strength
⅞ in. diameter.....7,000 lb. ultimate tensile strength
1 in. diameter.....8,200 lb. ultimate tensile strength
(Sisal rope possesses 25 per cent less strength than manila or hemp rope.)

1325. If rope is used for tying down vehicles which have a varnish finish, the rope should be wrapped with burlap or cotton cloth around that portion coming in contact with the spoke and felloe.

1326. (a) A metal clip or wood block should be used to fasten the ends of the rope to the car floor. The metal clip should be stamped to fit the rope and should be so made that two nails pass through the clip and rope, and two nails through the wings of the clip. The wood blocks should be not less than 2 in. by 4 in. by 6 in. grooved to fit over and pinch the rope. Clips or wood blocks should be spiked down over each end of the

rope as close to the wheel as practical. (See Fig. 100 for cut of metal rope clip.)

(b) To apply the rope to the wheel: If a spoke wheel—nail one end to the floor with one 10-penny nail (cement-coated preferred), then secure the clip or block to this end of the rope close to the wheel, cross the rope around the spoke, stretch the other end out and secure it with a 10-penny nail (cement-coated preferred) at the extreme end, aftr which apply a block or clip to the rope, drawing it down and making it taut. If a wire

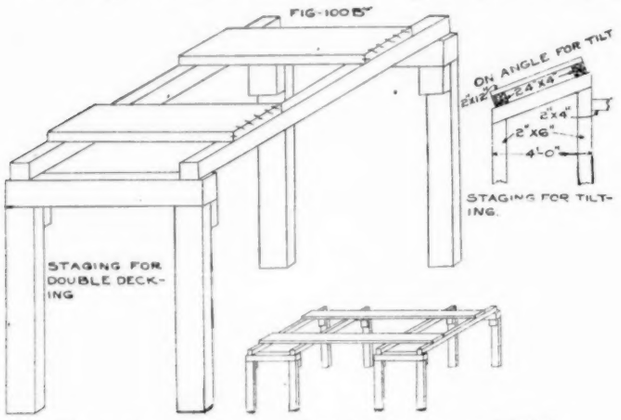


Fig. 100b.—Staging for Double Decking and Tilting

wheel—pass the rope over the felloe and fasten on the inside and outside as above. If a solid wheel—the rope may be passed over the hub. (c) If canvas or burlap straps are used, they must be fastened to the floor with blocks of not less than 1 in. by 4 in. lumber, not less than 6 in. long. The strap must be given one turn around each block and the blocks nailed to the floor with not less than 12-penny nails (cement-coated preferred). A metal stamping, not less than one 1/32 in. in thickness with 1/4 in. radius, may be used in lieu of a wooden block in securing the burlap to the floor of the car.

Nails

1327. Nails (cement coated preferred) must be as follows: Not less than 20-penny nails for wheel blocks (except the side nail in a solid block which should be a 10-penny nail), 20-penny nails in the heel blocks and 10-penny nails in the side strips and through the rope and rope clips. Where wood blocks are used for tying down the rope 20-penny nails (cement-coated preferred) must be used.

Tilting and Double-Decking

1328. Lumber to be used in construction of horses must be sound (free from decay and dote) and uniform in thickness

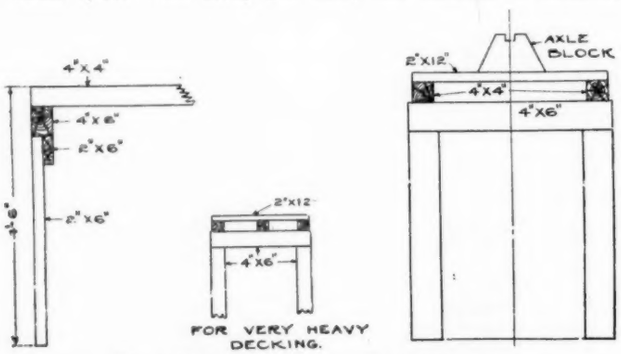


Fig. 100c.—Staging for Double Decking

and width. The supporting braces must be free from knots greater than one-fourth the width of the face of the board, and cross bracing must be free from knots greater than one-third of the width of the boards. No knots shall be permitted that interfere wieh the nailing.

1329. Lumber to be used for beams in staging shall be of high class structural material free from rot, loose or rotten knots and dote. When the beams are cut to size the aggregate diameter of knots in the center half of any side shall not exceed one-quarter the width of that side. No knot on the vertical sides shall be within one-quarter of the width of that side from the upper and lower edges.

1330. The principal woods used for double-decking and tilting devices and for cross bracing are grouped as follows:

Group No. 1

White Pine	Chestnut	Noble Fir
Norway Pine	Butternut	Magnolia
Aspen	Redwood	Buckeye
Spruce	Cucumber	White Fir
Western Yellow Pine	Sugar Pine	Cedar
Cottonwood	Cypress	Alpine Fir
Yellow Poplar	Basswood	Lodgepole Pine
Balsam Fir	Willow	

Group No. 2

Ash	Oak	Southern Yellow Pine
Hemlock	Maple	Hackberry
Elm	Beech	Douglas Fir
Red Gum	Virginia and North Carolina Pine	Black Gum
Sycamore	Tupelo	Birch
Larch		

1331. Group No. 2 should be used for all supporting members and either Groups No. 1 or 2 may be used for cross bracing.

1332. If Group No. 1 is used for support members, the lumber should be cut 1/2 in. thicker than when using Group No. 2.

1333. There are two methods employed in "double-decking." (a) Staging. (b) Truss or horse.

1334. Staging consists of uprights, supporting cross pieces, which in turn support a floor upon which rest the axles or wheels of the vehicle. The whole must be securely fastened to the freight car and strongly braced both horizontally and obliquely. (See Figs. 100-B and 100-C.)

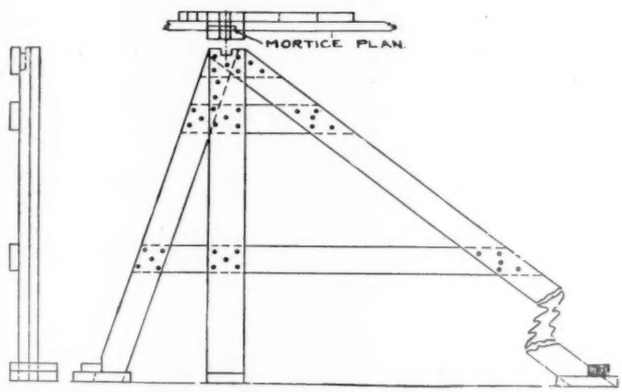


Fig. 100d.—Double Decking Horse with Mortise Head

1335. When two or more vehicles are tilted on the same freight car, the horses used for tilting are exactly the same as the horses for double-decking. Where only one vehicle is tilted, the horse has to take the strain alone, both forward and backward, and the construction differs accordingly.

1336. The outside legs of this horse are each of equal length and are braced at the bottom by a piece of 2 in. by 4 in. material spanning the entire length of the horse, properly beveled to fit the inward slope and nailed securely to the foot before the horse is placed in position. This foot brace is then nailed to the floor of the freight car. The horse is otherwise braced the same as the double-decking. (See Fig. 100-D.)

1337. The truss or horse method is the one recommended. It is adaptable to any size or kind of vehicle. The horse required for vehicles up to 3,000 lb. in weight, consists of two legs to the floor and an arm to the wall of the freight car. Four horses are required for double-decking and two for tilting vehicles, one for each wheel or axle raised. (See paragraph 1305 which governs.)

1338. The horse required for vehicles over 3,000 lb. weight, consists of three legs to the floor and an arm to the wall. In the lighter horse the lumber used for the legs consists of 2 in. by 6 in. material. Where three legs are used, this size is sufficient for weights up to 5,000 lb. For increased weights increase the size of the lumber; for instance, a truck weighing 10,000 lb. would have a central leg not less than 4 in. by 8 in. (See Figs. 100-H and 100-I.) (See paragraph 1305 which governs.)

1339. The horses for automobiles and light trucks are made approximately 6 ft. high, one leg 6½ ft. long and the other

10 ft. long. For larger vehicles, the legs are proportionately longer. The long legs of the front and rear horses on each side overlap each other and are nailed together after being put in place. It is unnecessary to remove the wheel where the hub caps are strong enough to take the weight of the vehicle. The horses must be reinforced by cross pieces of 2 in. by 6 in. material at the top and 1 in. by 6 in. material in the middle. (See paragraph 1305 which governs.)

1340. Another style of horse which may be used for vehicles weighing not more than 2,600 lb. net, consists of one leg to the floor 4 in. by 4 in. and three arms 2 in. by 6 in. by 36 in. to the

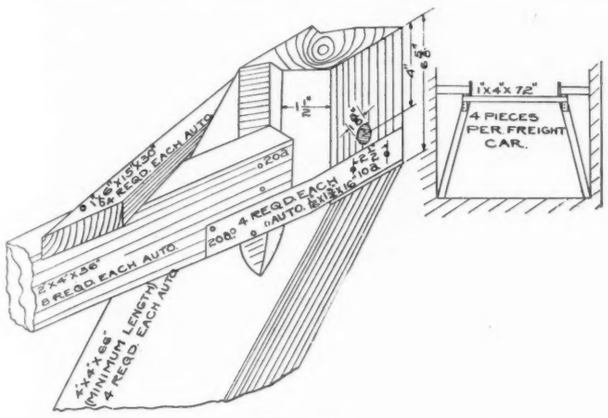


Fig. 100g.

wall. If the leg to the floor is made of 4 in. by 6 in. and the leg and arms are secured by steel straps or stampings, vehicles not exceeding 3,200 lb. net, may be loaded by this method. (See paragraph 1305 which governs.)

1341. The arms support the upright leg horizontally and are fastened to the car wall at the belt rail. One end of each arm rests in a notch or offset which has been made in the head of the upright and is fastened with 20-penny nails

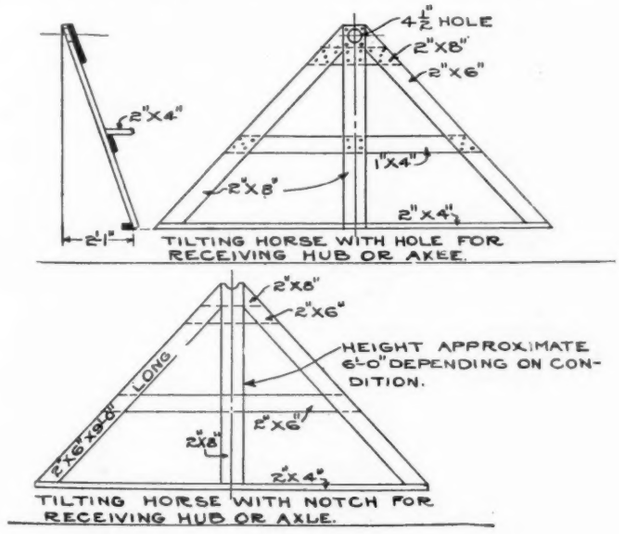


Fig. 100e.

(cement-coated preferred.) If the arm comes above or below the belt rail a runner of 2 in. by 6 in. lumber must be nailed along the side of the box car and the arms nailed to this runner. (See paragraph 1305 which governs.)

1342. At the end of each arm resting against the freight car wall must be placed a heel block not less than 2 in. by 6 in. by 8 in. (See paragraph 1305 which governs.)

1343. The third arm should be placed from the head of the upright upwards and outward to the car wall and fastened in place with a heel block, secured so as to prevent any upward movement of the horse. This arm is not necessary if a steel strap or stamping 8 in. long and the width of the upright member is used to fasten the upright leg to the car floor. See paragraph 1305 which governs.)

1344. The two rear horses and the two front horses, respectively, are fastened together laterally, with a timber 1 in. by 4 in. by 72 in. (See paragraph 1305 which governs.)

1345. The foot of each upright must be braced fore and aft with blocks 2 in. by 4 in. by 6 in. (See paragraph 1305 which governs.)

1346. The horizontal arms are further braced by steel strapping and by nailing to them a board of 2 in. by 6 in. back of the upright support. (See paragraph 1305 which governs.)

1347. Another adaption of the same system for automobiles not over 2,600 lb., is as follows: An upright support 4 in. by 4 in. by 66 in. (minimum length) mortised to take a specially constructed head (see Fig. 100-G). This head receives the end of two arms which take the longitudinal strains and one arm which takes the lateral strains. The arms are all made from material 2 in. by 4 in. and are reinforced on the car wall with heel blocks and at the head with steel strapping. (See paragraph 1305 which governs.)

1348. A further reinforcemtn consist of a brace of 2 in. by 4 in. lumber from a block fastened to the upright immediately below the head to the floor, at an angle of about 45 deg. This brace is reinforced at the floor with a heel block not less than 2 in. by 4 in. by 6 in. (See paragraph 1305 which governs.)

1349. It is best to fasten the legs of the horses to the car

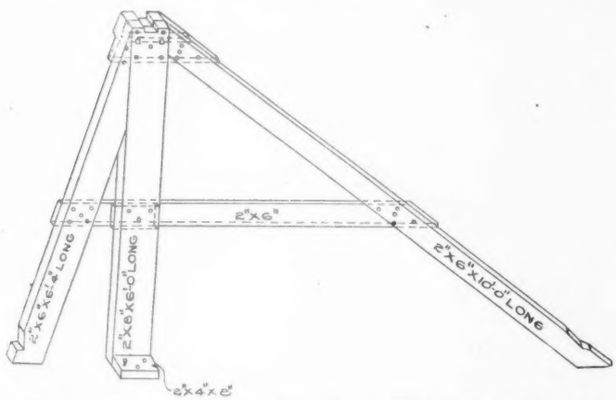


Fig. 100i.—Double Decking Horse With 3 Leg Eutting

floor by using an angular metal stamping 8 in. long and the width of the supporting members, but if these are found difficult to obtain a wooden foot lock may be used consisting of two pieces of 2 in. by 4 in. material nailed one on each side of the foot with a third piece across fitting into a notch made in the foot to receive it. (See Fig. 100-D.) (See paragraph 1305 which governs.)

1350. The 2 in. by 4 in. blocks on both sides of the foot should be beveled to accommodate themselves to the slant of the horse so as to make a snug fit. The inside block should be nailed to the foot before it is placed in the freight car. (See paragraph 1305 which governs.)

1351. There are several methods of construction which have been approved and which may be used in accordance with the necessities or requirements made by the special construction of individual vehicles, as follows:

Horse Head Construction

The quickest and cheapest method of construction is to form the head of the horse by bringing together the two pieces forming the legs so that they abut. This head should be notched to receive the hub or axle, and cross braces nailed and bolted on with ⅜ in. bolts through the top brace and legs. Where the vehicle is loaded on its hubs the top of the head should be twice the width of the hub. (See Fig. 100-E.) (See paragraph 1305 which governs.)

1352. The heavier vehicles require the addition of a third leg to the horse. The horse may then be constructed in any one of three ways, depending upon the weight or construction of the vehicle to be loaded.

(a) A center leg with two side legs abutting, cross braces nailed and bolted with two ⅜ in. bolts through the top braces and side legs. (See Fig. 100-I.)

(b) Side legs abutting at the top. The center leg fastened to the head thus formed; the whole cross braced, nailed and bolted

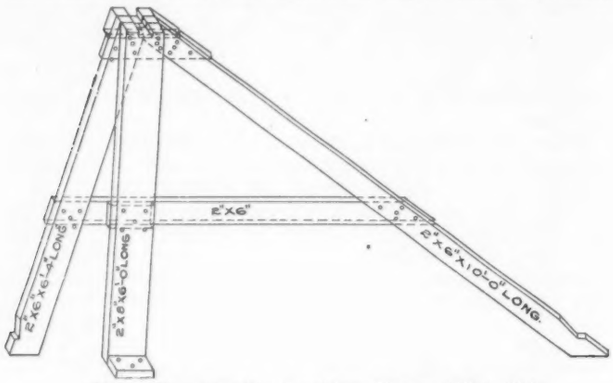


Fig. 100h.—Double Decking Horse With Side Leg Butting

with two ⅜ in. bolts through the top brace, side legs and center leg. (See Fig. 100-H.)

(c) Side legs mortised at the top, the center leg fastened to the

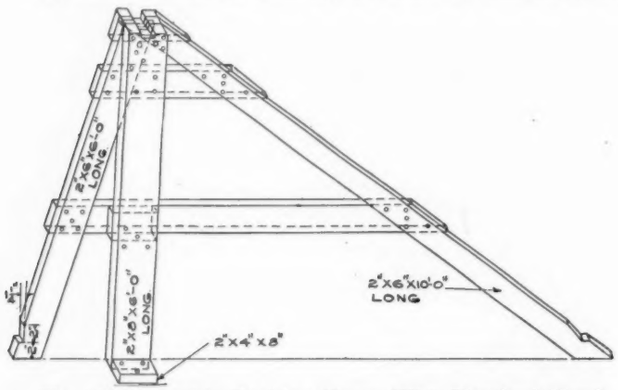


Fig. 100f.—Double Decking Horse With Morticed Head

head thus formed. The whole cross braced, nailed and bolted with two ⅜ in. bolts through the top brace, side legs and center leg. (See Fig. 100-F.)

1353. Another form of head construction may be used

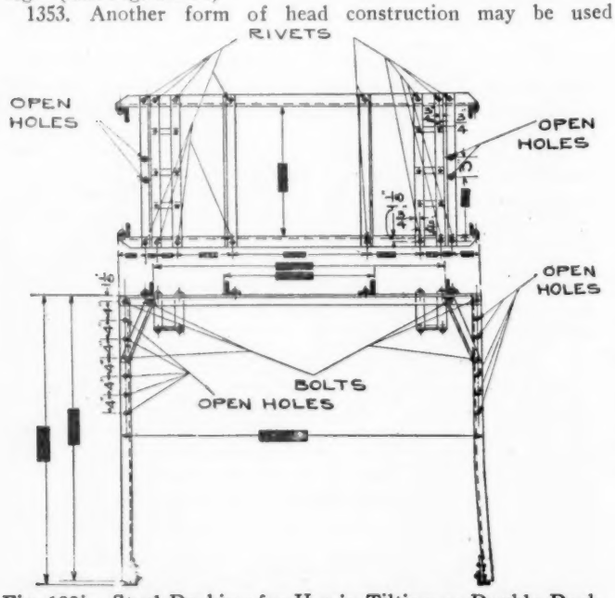


Fig. 100j.—Steel Decking for Use in Tilting or Double Decking Automobiles and Trucks

wherever desired; namely: A higher horse with "all-around head" having an opening to receive the hub or axle as shown in Fig. 100-E. (See paragraph 1305 which governs.)

1354. The lateral strains are taken on an arm made of not less than 2 in. by 4 in. material fastened horiontally between the horse and the wall of the freight car. (See Fig. 100-E.) The arm is supported at each end on a block 2 in. by 4 in. by 6 in. and fastened down with steel strapping. To hold the vehicle securely in the horse and to prevent any bounce or upward movement, steel straps are passed over the hubs or axles, crossed and nailed securely to the horse. A piece of two-ply 10-oz. burlap is placed under the strap to prevent chafing. (See paragraph 1305 which governs.)

1355. When steel decking, as shown in Figs. 100-J and 100-K, is used, the following precautions should be taken: (a) Lock nuts should be usel on all bolts. (b) Axles of automobiles, trucks or trailers should be fastened securely so the fastening will not come off if the tires deflate. (c) Angle *A* should be kept wrapped to avoid tire chafing. (d) All floor angles should be nailed through all holes and at the front and rear end of the

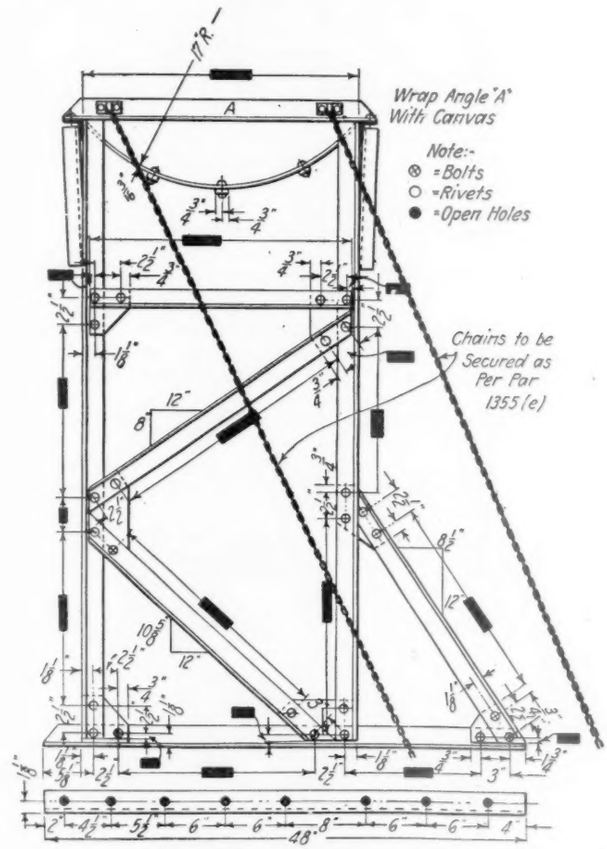


Fig. 100k.—End View of 100j

angle with not less than 20-penny nails, the top ½ in. of the nail to be bent over. (e) Two chains with plates securely attached in direction as shown should be used to tie each leg of the deck with a downward tendency and be securely fastened to the bracing of the car side which must be heavier than 2 in. by 4 in. and the anchor must not be more than 2½ ft. from the car floor. These chains should not be fastened to the car floor except in exceptional circumstances and then should be reinforced with 18 in. pieces of 2 in. by 6 in. securely nailed to the car floor over the plates. On flat cars fasten chains to side sills. (See Fig. 100-K.)

(f) The toes of the deck should be set toward the center of the vehicle supported. This applies to half decks or tilted loads as well. The chains for decks of tilted loads should preferably be used one in each direction.

1356. In lieu of the above methods of loading, automobiles may be loaded on their side as per Fig. 100-O.

PATENTS

1357. Of the methods of double-decking or superimposing automobiles, trucks and trailers, the staging system described

in paragraph 1334 is the only system not covered by patents and, therefore, the other systems specified cannot be used without purchase or proper authority from the patentee or his agent. The incut heel block shown in Fig. 100-A is also patented and subject to the same conditions. (See paragraph 1305 which permits the use of other constructions of equal strength.)

The committee recommends that, in view of the increased cost of the Loading Rules, these proposed changes and additions, if approved, be printed in the form of a supplement to the

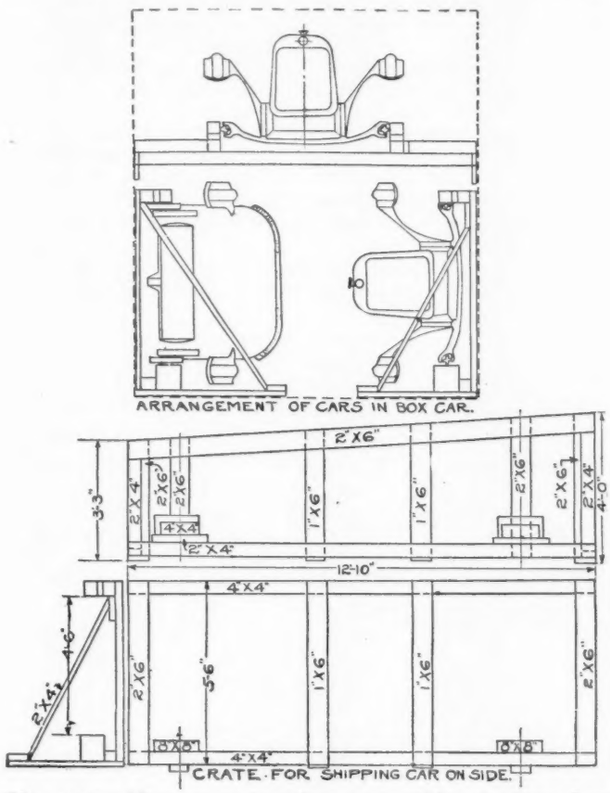


Fig. 100o.—Manner of Securing Automobiles in Box Cars When Loaded on the Sides

rules rather than revising the entire code, and that when the present stock of complete Loading Rules is exhausted the secretary be authorized to incorporate this supplement in any reprint made.

The report is signed by J. J. Burch (Chairman), Norfolk & Western; A. B. Corinth, Atlantic Coast Line; R. L. Kleine, Pennsylvania; H. H. Harvey, Chicago, Burlington & Quincy; C. N. Swanson, Atchison, Topeka & Santa Fe; E. J. Robertson, Minneapolis, St. Paul & Sault Ste. Marie; J. E. Mehan, Chicago, Milwaukee & St. Paul, and Samuel Lynn, Pittsburgh & Lake Erie.

Before presenting the report of the Committee on Loading Rules, Mr. Burch said:

Since the printing of the Loading Rules, your committee has found it desirable to make some slight changes and additions in the report which they would like to have included in the report.

Discussion

Mr. Burch: The first sentence of paragraph 1306 will be cut out. The committee thinks it advisable to add a note to paragraph 1324, as follows:

Note: Any mechanical device for holding down the wheels equally efficient to that specified will be accepted as an alternative arrangement.

Mr. Gaines: May I interrupt one moment? Inasmuch as this report has been distributed, I think it is unnecessary to read all these details. I think it would be much better to call attention to what changes have been made, and answer any questions that may be asked from the floor on the subject. We are taking up a long time on this detail work.

Mr. Burch: I was reading that on account of the change, which reads as follows: The committee has decided to change paragraph 1340, the third line "2 x 6." to read "2 x 4 x 36," and the fourth line——

Mr. Milner: Can the speaker try to make himself heard back here, please?

Mr. Barnes: I would like to amend the motion, and in view of the fact we have all had the paper, and ample chance to read it, I move that the paper as prepared be accepted, and referred to letter ballot.

Mr. Burch: You haven't heard the paper as prepared. There are some slight changes which have been made in the report since the printed copy went out. Paragraph 1340, the third line, should read: "4 in. and 3 arms 2 x 4 in.," instead or "2 x 6 in.," and the fourth line, after the word "and," "the arms 2 in. x 6 in. x 26 in. and." That is to clarify the paragraph.

Paragraph 1341, at the end of the sentence, line 4, add "See Fig. 100G."

Paragraph 1346, line 2, change "2 x 6" to read "1 x 6 x 15 x 30 in." That is to make the paragraph conform to the cut.

Because of an accident which we had on the Pennsylvania with some steel loading we would like to ask that paragraphs 555, 555A, 555B, 555C and 555D be approved by the convention, so that the rules can be made effective at once. I think that is very necessary because these rules are now followed by some other steel shippers. I overlooked stating that I would like to add a sentence to the paragraph referring to spacing blocks, making the composite spacing blocks an alternative method, and the committee will prepare cuts showing the block to be used and will follow up the subject of blocks during the coming year and make a report at the next convention.

C. M. Swanson (A. T. & S. F.): Being a member of the Loading Rules Committee, I know of the untiring effort of our chairman for the last two years in changing the rules into sections, for different commodities. We have had meetings all over the country with manufacturers of steel, tubes, automobiles, concrete pipe, and lumber dealers, and I do not believe that at any time there has been such hearty co-operation between the carriers and the manufacturers as there is at the present time. I feel that the work that the chairman and the committee have done has been the means of bringing together in closer co-operation the interests of the carrier and the manufacturer. The great majority of the suggestions are made by the manufacturers owing to their large experience in handling their special commodity. I also find that the manufacturers are not supplied sufficiently with the loading rules. The Loading Rules are not distributed to the men who actualy shoud have them.

Mr. Gaines: The committee on Loading Rules has done a very fine job in segregating these rules. About a year ago I was delegated by the Director of the Southern Region to go down on the west coast of Florida and settle a three-cornered fight between the Emergency Fleet Corporation, a timber contractor and some of the railroads, regarding loading piles for Hog Island. I thought I knew something about the Loading Rules, but when I came to go into the details of it I found that I did not know anywhere near as much as I thought; then I stepped down and tried to study them out. I found that Rule 101 tells you to look at Rule 3, and when you look at Rule 3 that tells you to look at Rule 48, and then I wondered what a car inspector out on the job ever could tell about it. I think this report will go a great way toward simplifying the work for the people doing the loading, and the man loading piles, or loading concrete pipe, or any other commodity, can look at the rules covering that commodity instead of referring back from one rule to another rule, dealing with something else.

A motion that the recommendation of the committee, in regard to the special circular being issued, be adopted, was carried.

Mr. Snyder: I want to add one suggestion: The rule calling for the spacing block is given in the front of the book, but is not repeated in the steel loading rules. It should be added to that pamphlet when that is prepared.

Secretary: That has been done. It is in every pamphlet.

Mr. Fuller: Mr. Chairman, I move you that the Rules be received and submitted to letter ballot, with the exception of that part that has already been passed on.

The Chairman: What about the spacing block suggestion?

Mr. Fuller: I think that is all right. I think it should be included in all the rules.

The Chairman: They want to go back to the composite spacing block.

Mr. Fuller: I haven't anything to say about that.

Mr. Lynn: I move that the use of the composite block, as recommended, be continued for another year, so that the committee can get sufficient data to determine just what it should do next year. I would make that as an amendment to Mr. Fuller's motion.

The amendment was put to vote and carried, and then the original motion was voted on and carried.

Report of Committee on Car Construction

W. F. Keisel, Jr.
Chairman

IN THE PAST YEAR, the subjects referred to the Committee on Car Construction were: First: The revision of Rule 22 of the 1917 Code of Rules of Interchange; and, second: Suggested provision for side door openings 10 ft. wide in all box cars, the side door proper to be 6 ft. wide, with a removable door post, and an auxiliary door 4 ft. wide.

M. C. B. Circular of Inquiry, No. 19, was sent out to all members, asking for suggestions and recommendations for changes in Rule 22 of the Code of Interchange, and the replies thereto were carefully considered by the committee, based on which the following rule has been formulated, and is offered herewith as a substitute for present Rule 22.

For Cars Having Wooden Sills

Rule 22: Draft timbers must not be spliced. Longitudinal sills must not be spliced between or over cross-bearers. Longitudinal

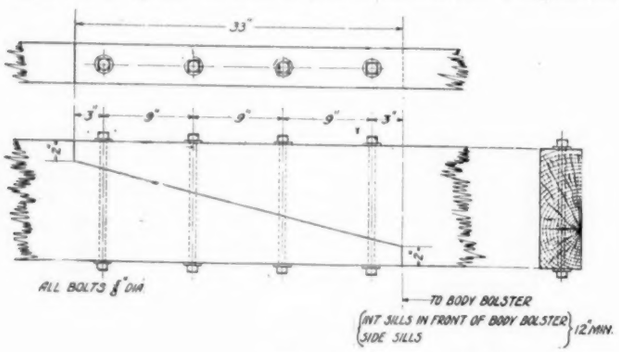


Fig. 10

sills (intermediate or side sills) may be spliced at both ends, on either side of the body bolster. The nearest part of the splice must not be less than 12 inches from the edge of the body bolster. Intermediate sills, spliced between the the body bolster and cross-bearer, must be reinforced as per Figs. 11 or 11-A. Intermediate sills, spliced between the bolster and the end of the car, and side sills, spliced on either side of the bolster, must be in accordance with Figs. 10 or 10-A.

When splicing or renewing any longitudinal sill, the reinforcement shall be applied to all existing non-reinforced splices, in all sills except side sills. If the old splice is a four-bolt splice, it shall be reinforced in accordance with Figs. 11 or 11-A. If the old splice is a three-bolt splice, the reinforcement shall be applied in accordance with Fig. 15.

Center sills shall be spliced only between the body bolster and cross-tie timber. The nearest part of the splice must not be

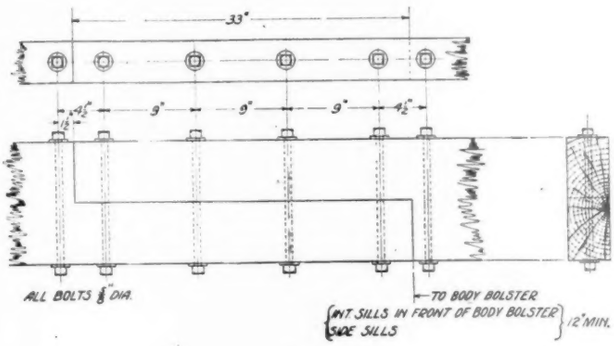


Fig. 10a

less than 24 in. from the edge of the body bolster. Center sill splices shall be in accordance with Fig. 11. The diameter of horizontal or vertical splice bolts shall be ⅝ in.

For Cars Having Steel Center Sill Splices Located at Least Seven Inches from the Face of the Bolster

Adjacent sills may be spliced. All splices shall be of the butt-joint type, reinforced on both sides by plates not over 24 in. in length, and not less than twice the length of the protruding end when the projection is less than 12 in. The reinforcing plates shall be at least as thick as the web of the sill. The splice plate on the flange side of the sill shall be U-shaped, to include flanges, while the plate on the opposite side shall cover the web only. Rivets to be placed as shown in Figs. 12 and 12-A. Where autogenous welding is available, the sills may be welded after rivet-

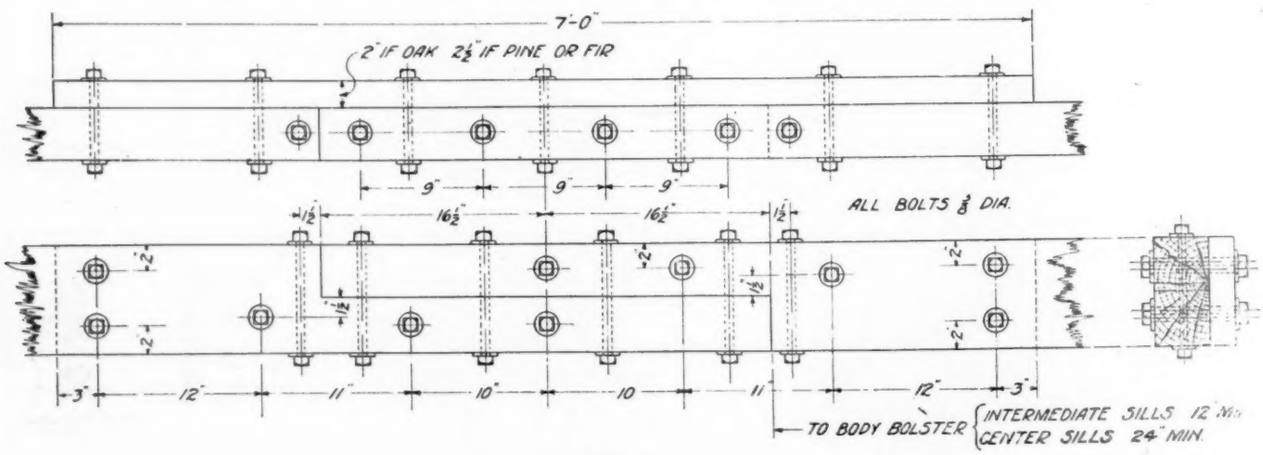


Fig. 11

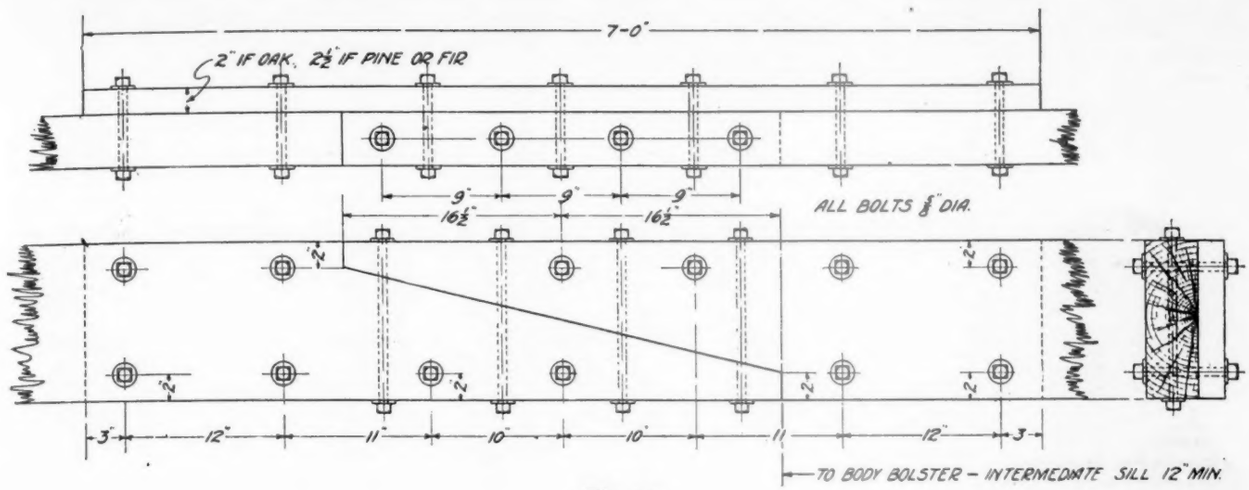


Fig. 11a

ing the U-shaped plate on the flange side, omitting the flat plate on the web side.

For Cars Having Steel Center Sill Splices Located Between the Body Bolster and End Sill, and Less Than Eight Inches from the Face of the Bolster

All splices shall be of the butt-joint type, with the addition of a cover plate. The splice plates shall be at least as thick as the web of the sill. They may be located on either side of the sill, extending forward and back of the center line of the bolster 30 in., as shown in Figs. 13 or 13-A. The rivets shall be spaced as shown.

Side Sill Splices

All splices must be of the butt-joint type, reinforced on both sides by plates 14 in. long. The reinforcing plates shall be at least as thick as the web of the sill. The splice plate on the flange side of the sill shall cover the web only, while the plate on the opposite side shall be flanged over the bottom leg of the side sill, and riveted to it, as shown in Fig. 14. The splice may

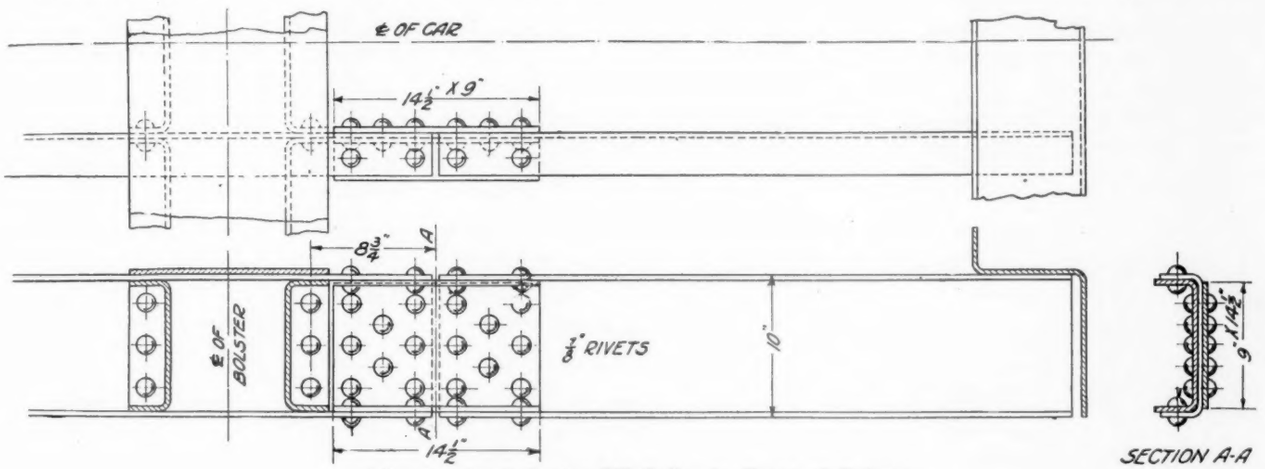


Fig. 12.—Steel Center Sill Splice in Front of Bolster

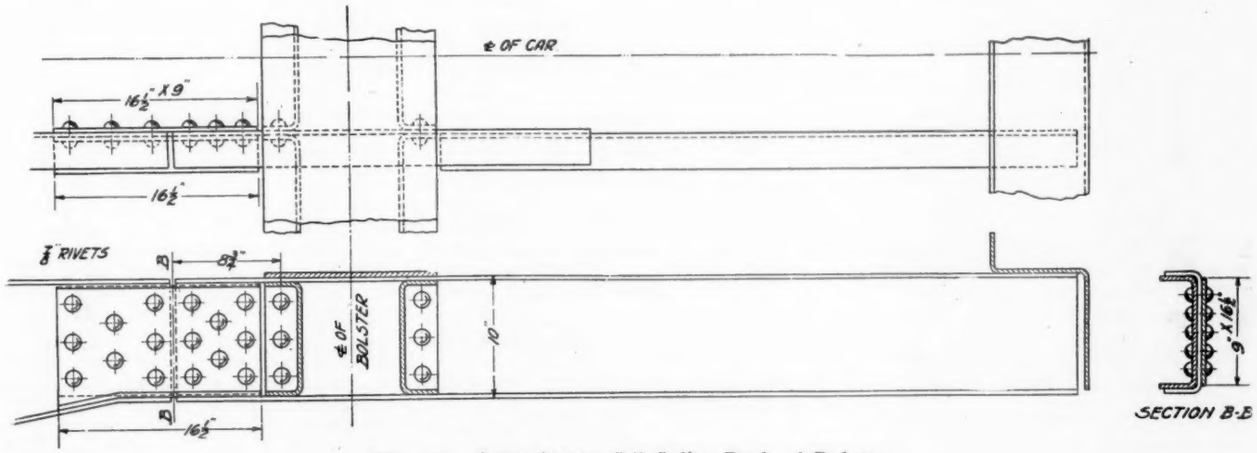


Fig. 12a.—Steel Center Sill Splice Back of Bolster

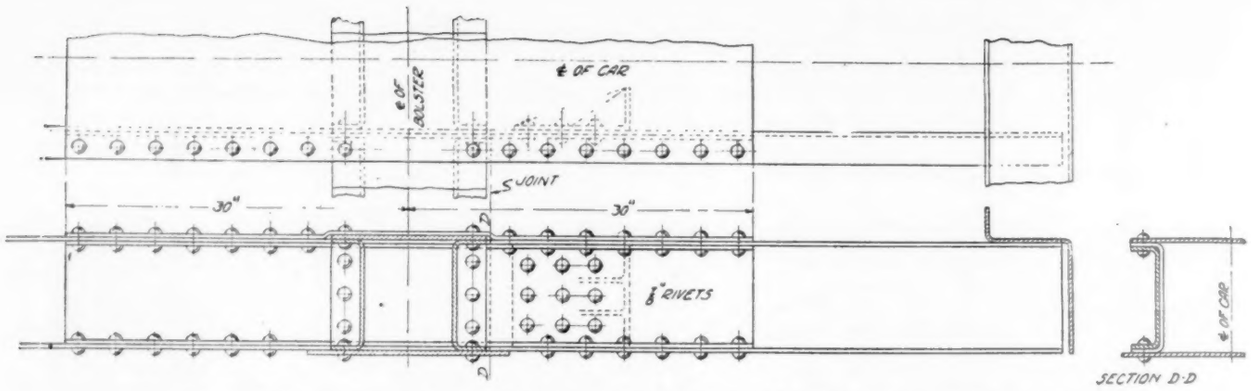


Fig. 13.—Steel Center Sill Splice (Outside), Less Than 8 Inches From Face of Body Bolster

be located on either side of the body bolster. The rivets shall be spaced as shown.

Side sills may also be welded by the autogenous process, making the thickness of the metal through the weld one and one-half times the thickness of the metal in the sill, in which case the reinforcing plates and rivets shown in Fig. 14 may be omitted.

The traffic manager of the General Motors Corporation suggests the following for box car side doors: "It has long been my contention that a 6-ft. wide side door, with a movable post, and a 4-ft. extension beyond, is the proper kind of a door to be used on either 36-ft., 40-ft. or 50-ft. cars. This kind of a door enables everyone to use a box car. In other words, with only

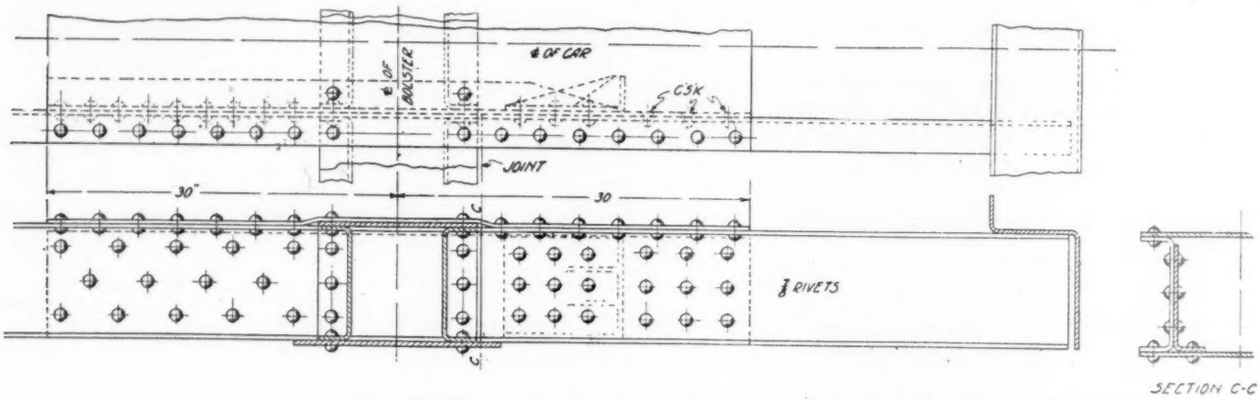


Fig. 13a.—Steel Center Sill Splice (Inside), Less Than 8 Inches From Face of Body Bolster

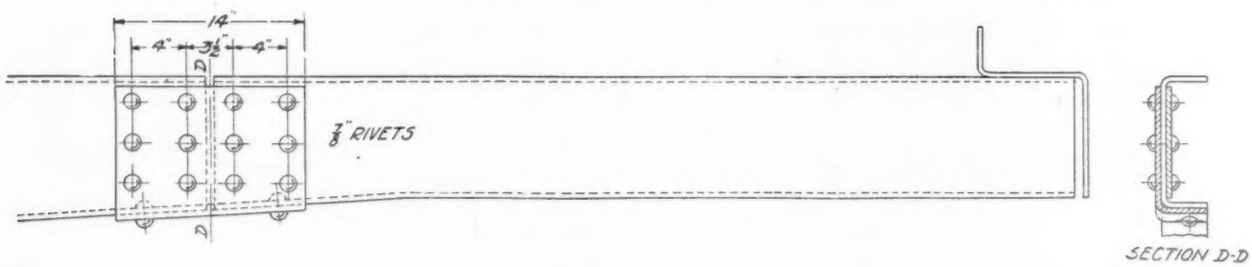


Fig. 14.—Side Sill Splice

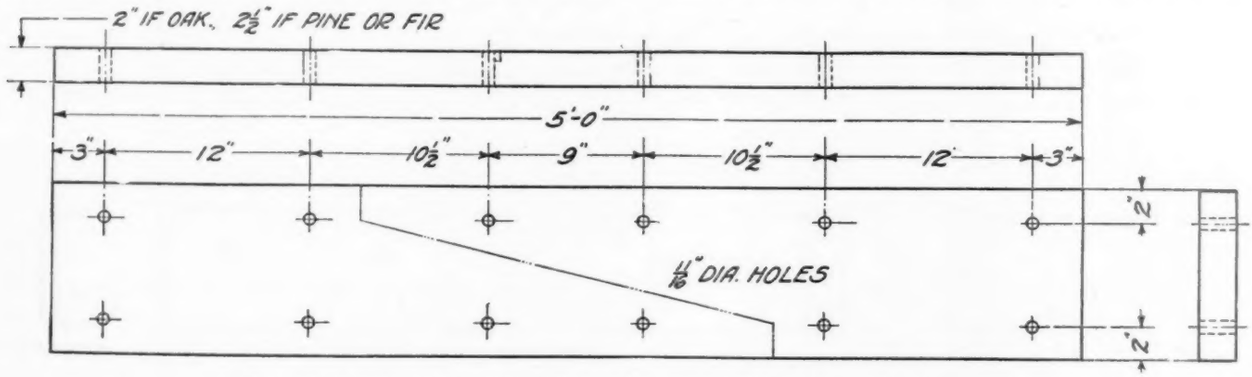


Fig. 15.—Center and Intermediate Si ll Three-Bolt Splice Reinforcement

a 6-ft. door it confines the use of this box car to certain commodities, and certain other commodities, such as light and bulky articles, are excluded from the use of these cars, as it is impossible to get a light and bulky commodity in anything less than an 8-ft. wide side door—10 ft. wide preferred. If all box cars in future were equipped with the kind of a door above described, it would mean that on a car coming into our factory, loaded with any kind of commodity, when this car was unloaded we could immediately use this car for loading automobiles or trucks, by removing the post and taking advantage of the 4-ft. additional extension. This, you will note, gives a load to the car in both directions, and means that there will be practically no empty movement of a box car in any direction, as it could be used for all classes and kinds of commodities from merchandise to grain."

The point raised in the above is a matter of policy, for adoption or rejection by the management of the railroads. It, however, raises the question of providing a satisfactory design of door openings, wider than 6 ft., as a basis of construction. Special automobile cars with side door openings varying in width from 8 to 12 ft., and some with end doors 8 ft. and more in width, are in existence. If so directed, the committee will take up the task of providing such side door ensign.

The report is signed by W. F. Kiesel, Jr. (Chairman), Pennsylvania; A. A. Ayers, New York, Chicago & St. Louis; C. E. Fuller, Union Pacific; E. G. Chenoweth, Chicago, Rock Island & Pacific; J. C. Fritts, Delaware, Lackawanna & Western; C. L. Meister, Atlantic Coast Line, and H. T. Bentley, Chicago & North Western.

After presenting the report Mr. Kiesel read the following communication from the committee.

To the Members:

Under date of June 9, 1919, your secretary, V. R. Hawthorne, sent us the following copy of communication from F. C. Ferry, master mechanic, L. H. & St. L., dated April 5, 1919:

"I am in receipt of your Circular No. S-111-No. 2, requesting suggestions as to subjects for committee investigation during the year from June, 1919, to June, 1920, reports to be submitted to the 1920 annual convention.

"Question: 'Why is it that refrigerator cars cannot be so arranged as to prevent salt water dripping on the rails, etc.; lack of such an arrangement causes untold thousands of dollars of damage every year.'

"Rule 3, Paragraph F, Rules of Interchange, Master Car Builders' Association, provides that cars lacking such an arrangement mentioned in above question, shall not be accepted in interchange after October 1, 1920. This rule has been promulgated from year to year, but has been rendered null and void and of no effect by reason of postponement of the effective date. Why not put an end to this evil and have done with it?"

The Secretary stated that he was instructed to refer this matter to the Committee on Car Construction, to investigate and report at the convention in connection with their regular report; also to consider and advise as to observations of the use of open tanks.

Your committee has made an investigation of the status of the question of salt water drippings from refrigerator cars to date.

In 1898 a committee consisting of Messrs. S. Higgins and A. M. Waitt made a report on "Rust From Salt Water Drippings." This committee presented two methods of equipping refrigerator cars without much expense, and submitted two drawings, the object being to lead the salt water to the center of the track, instead of permitting it to drop at or near the rails.

In 1910 the following rules were adopted:

1. All salt water drippings should be retained in the ice tanks and drained off only at icing stations.

2. The total capacity of drain openings should not exceed the capacity of traps, and the capacity of both drains and traps should be sufficient to release all drippings within the time limit of icing the train.

3. The mechanism adopted for handling drain valves should be simple and positive, and so designed as to insure closing the valves before hatch plugs can be returned to their places.

4. Salt water drippings should be conducted from ice tanks through the drain valves above described and thence to the outside of cars through the regular traps and drain pipes.

In the interchange rules, Rule 3, paragraph F, reads as follows: "After October 1, 1920, no car carrying products which require for their refrigeration the use of salt with ice, and which are equipped with brine tanks will be accepted in interchange, unless provided with suitable device for retaining brine between icing stations."

We also find records that some of the members of this association have made independent investigations.

In January, 1905, C. A. Schroyer, superintendent car department, C. & N. W., wrote to important railroads operating dressed beef refrigerators, in order to ascertain the results of following the M. C. B. Recommended Practice of 1898. To the best of our knowledge he did not receive any very encouraging replies, and the consensus of opinion semed to be that it is not feasible or desirable to consider the application of tanks for the retention of the brine. This referred only to such cars as were equipped with so-called "ice baskets," for we find that some milk cars and also some meat cars have been equipped with brine tanks, somewhat of the nature of those recommended by the M. B. C. Committee in 1910. An arrangement of this kind is shown on plate *A*, attached hereto. The brine tanks there shown have a pipe arrangement so installed that the upper part of the tanks can be emptied at terminals by opening certain valves, and when these valves are closed the pipe openings are at a sufficiently higher level to retain all of the brine plus the water from the ice meltage; should, however, there be too much water collect, there is a possibility for this water to overflow.

There has not been sufficient time to ascertain from all railroads how many cars they have equipped with brine tanks, but our perliminary investigation indicates that there are very few cars so equipped, and that the bulk of the refrigerator cars are equipped with so-called ice baskets, in which the ice is loaded, and all of the drippings pass out through traps to the track. On some cars there is a trough leading these drippings toward the center of the track and on other cars the traps are directly under the car side, where the drippings escape the rail. When meat is loaded in these cars it is the custom to add salt to the ice.

Although the question of guarding against damage from brine has been raised periodically, there has been little specific evidence produced to show the seriousness of the effect therefrom.

We should first determine whether this is sufficiently serious to justify making radical changes in present practice.

Explicit detail information should be obtained from the Maintenance of Way Section concerning the extent of damage, traceable to brine from refrigerator cars, that has been done to bridges, tracks and other maintenance of way structures; also whether any attempt has been made to protect these structures and with what success.

While this information is being collected, your committee will get in touch with Mr. Ferry in order to ascertain the details of damage to permanent structures on which he based his observations.

Respectfully submitted,

COMMITTEE ON CAR CONSTRUCTION.

Discussion

Mr. Gaines: Referring to the diagonal splice shown on page 3. There is an alternate splice on the next page, and if I am not mistaken, the committee made a report to this association several years ago, showing tests made on the two forms of splice. There was no question whatever at that time that the splice shown on page four was much the stronger form of splice, and it is much the cheaper to put in a car when you are splicing sills. As it stands, I think that we ought to discard that old diagonal ship splice that you have on the first page.

Mr. Lentz: I recall the tests made in the shops at that time, and the results were as stated by Mr. Gaines.

Mr. Gaines: In addition, I am going to make a motion that in publishing this report we do away with that diagonal splice. It is expensive, is hard to make, and is not strong. I move that we eliminate it.

Mr. Goodnow: At the time that investigation was made the splice shown on page 4, as a bucking proposition ,was the best, but the other splice, the ship splice, as Mr. Gaines referred to as a load carrying proposition for inner sills, was considered at that time to be a better splice than the buck splice.

Mr. Gaines: If you had that splice made accurately, possibly that might be true; but the average carpenter is not matching a diagonal ship splice, and I doubt that as a load carrying proposition, as a buffing proposition, as a pulling proposition, or in any other respect, it is as strong as the straight splice.

Mr. Keisel: We do not have this splice, shown in Fig. 10, for center sills, which take buffing action. They are used in intermediate sills, where they are under bending action, and that type of sill makes a stronger sill with that type of splice than the butt splice for bending. The report says: "Intermediate sills spliced between bolster and end of car, and side sill, spliced on either side of bolster, must be in accordance with Figs. 10 or 10-A." Therefore, it is not a buffing resistance that we get, but a bending resistance.

Mr. Gaines: I am willing to admit that, theoretically, for loading, the diagonal ship splice may be the stronger, but under practical conditions, in the car yard, you are not getting anything like what you think you are getting in theory, and you can get a straight butt splice which will be as strong, and stronger, practically, than the other. I am in favor of eliminating the diagonal splice.

Mr. Keisel: You can have either one. It reads "must be in accordance with Figs. 10 or 10-A." You can make it either diagonal or butt.

I. S. Downing (C. C. C. & St. L.): Some years ago two splice tests were made on the C. B. & Q. at Peoria, Ill., and Mr. Young had charge of the tests. That test showed that in no manner was the ship splice as strong as the butt, in any of the tests which we made.

John McMullen (Erie): I wonder if Mr. Gaines took into consideration that if we splice a 14 in. side sill and cut it in the center, making the butt splice, if we are going to have as good a sill, to carry the load as we would have with the ship lap splice. I think it would be a mistake to make the butt splice on all sills, because in the 14 in. sill you have 2 in. on the bottom, and that would leave 12 inches of sill, otherwise you will cut it in two and ony have 7 inches.

Mr. Gaines: In the ship lap splice you have only 50 per cent when you cut it down, and I think Mr. Young answered the question as to the strength. I do not believe that one car repairer out of ten can make a perfect ship lap splice.

H. H. Harvey (C. B. & Q.): I am very much in favor of the butt splice, but this committee's recommendation is on Rules of Interchange, and you have both forms of splice. You will have to leave the report as it is and mention both kinds.

H. M. Curry (N. P.): Mr. Harvey brought out a question which came to my mind: If the recommendations formerly made were in favor of the butt splice, why was the other adopted? Some of the real old-time car men might give us some advice on that subject.

J. J. Hennessey (C., M. & St. P.): When the butt splice was first adopted it was altogether, as stated by Mr. Young, on the center sill, and leaving it optional to use either splice on the side or intermediate sill. That was the first report we made to the association, and I believe the report of the committee to-day, to leave it optional, is a correct report.

I would not advocate the use of ship lap splices in center sill construction, but there are conditions and times when it is easier to apply a ship lap splice, especially between the body bolster and end sills on intermediate and side sills, than it is to apply the butt lap splice.

F. W. Brazier (N. Y. C. Lines): I agree with what Mr. Hennessey says. On the other hand, it is optional, and you can use either one you like. When the first ship lap splices were put into the rules it was because we had car men who were mechanics, and to-day we have not got them, and we put something easy in the rules, so that the mechanics can work it out. You can use it if you want to. The ship lap splice, as the report leaves it, is optional.

Mr. Gaines: It has been determined by actual test that the ship lap splice is not as good nor as strong as the butt splice, and to make it requires a better grade of mechanics than we have to-day. In view of the present state of the art, we should eliminate the ship lap splice from our rules, and take the one that can be made.

Chairman: How would you cover that in interchange?

Mr. Gaines: I would not bar that out in interchange.

Chairman: How do you know when it is made? A man might make a splice tomorrow and you would not know whether it was made a year ago, or six months ago.

Mr. Gaines: I would put in the straight butt splice as recommended practice to get rid of the ship lap splice. I have seen ship lap splices that did not meet within an inch.

Mr. Hennessey: If you put the butt splice in, and it does not meet within an inch, you do not know what you have then. The report leaves the matter as optional, and you must be careful not to get things into the interchange rules which will cause a turmoil for years to come. It will be impossible for an inspector in the yard to say when the sill was spliced, if you pass it along on your own road, and leave it there for years.

Mr. Gaines: As my motion was not seconded, I will withdraw that, and make another motion. The recommendation of the committee on page two says "must be in accordance with Figs. 10 or 10-A," and I now make the motion that that portion of the report be amended to read "must be in accordance with Figs. 1 0or 10-A, but the latter preferred."

This motion was put to vote, and carried.

A motion that the report be accepted and go to letter ballot, and that the committee be continued to investigate the question of salt tanks was then made and carried.

The Report of the Committee on Car Trucks

J. T. Wallis
Chairman

Under date of February 10, 1919, the secretary of the M. C. B. Association, at the request of the Car Service Section of the United States Railroad Administration, referred to the Committee on Car Trucks correspondence on the subject of marking freight equipment cars to show the load limit and requested the committee to make a report to be submitted to the Car Service Section.

This correspondence covered two points, viz.: First: Failure of axle in service due to being overloaded in accordance with the marked capacity on the cars, particularly the 60,000 lb. capacity cars. Second: Difficulty and confusion in determining the allowable lading that may be placed on the car from the weight markings stenciled on the cars as well as from the provisions of the M. C. B. Rules of Interchange governing the amount of load that may be carried.

The axle complication dates back to 1896, when it was found that the axles used at that time were too light to carry the load and axles of proper dimensions were designed. These axles, as subsequently modified and adopted as a standard of the association, have given satisfactory service without failure when purchased in accordance with the specifications. However, the condemning limits of the lighter design of axles, of 40,000 and 60,000 lb. capacity, were carried along in the interchange rules and in only the more recent years condemning limits were added for the M. C. B. standard axle. No penalty in repairs was provided for substituting a Non-M. C. B. standard for an M. C. B. standard axle until recently and the failure to have in stock M. C. B. standard axles resulted in axles of the same journal diameters, but different diameters at the wheel seats and the center of the axles, being under the same car. After the Rules of Interchange provided condemning limits at the wheel seat for both M. C. B. and Non-M. C. B. standard axles of the same capacity, some roads resorted to the practice of turning down the wheel seats of M. C. B. standard axles below the minimum limit and used such axles as Non-M. C. B. standard, thus prolonging the life of Non-M. C. B. standard axles and defeating the object

of having all cars in service equipped with standard M. C. B. axles. In some cases these axles with M. C. B. standard journal and center dimensions, but wheel seats below the minimum limit, were improperly applied in repairs to cars equipped with standard M. C. B. axles, causing justified complaints from the car owners. Furthermore, odd sized axles were introduced and applied to cars marked 50,000 and 70,000 lb. capacity.

Cars have been marked with varying capacities as follows: 40,000, 45,000, 50,000, 60,000, 65,000, 70,000, 80,000, 85,000, 90,000, 100,000, 105,000, 110,000, 115,000, 130,000 and 140,000 lb. capacity, notwithstanding that we have but five M. C. B. standard sizes of axles as follows:

M. C. B. Standard Axle	Journal Size	Nominal Capacity (Load)	Total Weight (Car and Load on Rail)
A	3¼ in. by 7 in.	40,000 lb.	66,000 lb.
B	2¼ in. by 8 in.	60,000 lb.	95,000 lb.
C	5 in. by 9 in.	80,000 lb.	132,000 lb.
D	5½ in. by 10 in.	100,000 lb.	161,000 lb.
E	6 in. by 11 in.	140,000 lb.	210,000 lb.

NOTE.—The above table is based on four-wheel truck cars (four axles per car). The loads for six-wheel truck cars (six axles per car) would be 50 per cent greater than given in the table.

The various markings can be attributed to the following: (A) Heavy light weight of body (as in the case of refrigerator cars) plus nominal capacity, including 10 per cent excess lading, exceeding the nominal car capacity for the axles used. (B) Low light weight of body (as in the case of flat and open top cars) plus nominal capacity, including 10 per cent excess lading, being less than the safe load the axles will carry. (C) Some cars being marked with capacity markings disregarding the safe load the axles will carry. (D) Other cars marked with "Load Limit" weight in order to obtain the maximum paying load on the car based upon the safe load for which the axle was designed.

This has caused general confusion and it, therefore, seems evident that some standard method of marking cars with weight markings should be adopted, which from a safety standpoint must be based on the safe allowable load on the axle used under the car and should be stenciled on the car, indicating the total weight of the car and lading as resting on the rails. This would indicate to scale agents, when cars are weighed, whether the car is overloaded or not without making any calculations; however, it would be necessary for them to record the light weights as at present in order to obtain the weight of the lading for billing purposes, which makes necessary the stenciling of the light weight on the car. The maximum load weight, difference between total weight and light weight, should also be shown as the maximum limit weight of lading which shippers can load on the car. These markings should, in the opinion of the committee, be:

MAX LOAD ..... 000 000 Lb.
LIGHT WT ..... 00 000 Lb. New 3—19

TOTAL WT ..... 000 000 Lb.

Max Load to include lading, as well as ice, brine or packing or blocking material used in connection with transporting the load shipped on the car. It is the difference between the total weight given in M. C. B. Interchange Rule 86 and the light weight of the car. This is the absolute maximum that can be placed on the car and no percentage for overload is allowed.

Light Wt to be the weight of the empty car resting on the rails.

Exhibit A

TOTAL WEIGHT LIMITS BASED ON SAFE ALLOWABLE LOAD ON AXLES (FOUR AXLES PER CAR).

Normal Capacity of Car Lb.	M. C. B. or Standard Non-standard.	Permissible Weight of Car and Lading on Rail.	Journal Diameter. New.	Journal Diameter. Worn Limit.	Wheel Seat Diameter. New.	Wheel Seat Diameter. Worn Limit.	Center Diameter. New.	Center Diameter. Limit.
140,000	M. C. B.	210,000	6	5½	7⅝	7⅜	6⅞	6⅞*
100,000	M. C. B.	161,000	5½	5	7	6¾	5⅞	5⅞*
80,000	M. C. B.	132,000	5	4½	6½	6¼	5⅜	5⅜*
70,000	Non-standard	105,000	...	4	...	5⅝	...	4⅞
60,000	M. C. B.	95,000	4¼	3¾	5¾	5½	4¾	4¾†
	Non-standard	78,000	...	3¾	...	5	...	4⅜
50,000	Non-standard	66,000	...	3½	...	4¾	...	4⅛
40,000	M. C. B.	66,000	3¾	3¼	5⅛	7⅞	4¼	4¼†
	Non-standard	56,000	...	3¼	...	4⅝	...	3⅞

NOTE.—The Rules of Interchange provide that M. C. B. standard axles of 80,000 lb. capacity and over (marked *) may have a limit at the center of the axles ⅛ in. lower than the standard axle when new, and that the 60,000 and 40,000 lb. capacity M. C. B. standard axles (marked †) may have a limit at the center of the axles ¼ in. lower than the standard when new. The committee is of the opinion that all new axles should be strictly in accordance with the standards, and the allowances now provided in the rules should only apply to existing axles under the equipment.

Total Wt to be the sum of the Max Load that can be placed on the car and the Light Wt of the empty car. This total weight is shown for each size of M. C. B. standard axle under M. C. B. Interchange Rule 86.

NOTE.—The toal weight given in the M. C. B. Rule of Interchange 86 is based on the safe load for four axles, of the respective capacities, shown on M. C. B. Standard Sheet 15, plus the weight of the wheels and axles.

These markings involve a safe predetermined value for all axles now used under the cars and the committee has placed safe load limits on the Non-M. C. B. standard axles, figured on the same basis as the M. C. B. standard axles as shown in Exhibit *A*.

It will be noted that the carrying load for the Non-M. C. B. standard axles of the lighter capacity cars, 60,000 lb. capacity and less, are considerably reduced over the nominal capacity plus the usual 10 per cent. This mainly affects the house cars, as there are few open top cars of these low capacities and house cars very rarely carry loads up to their nominal capacity. On the other hand, it permits cars of 80,000 lb. capacity and over, which comprise the modern equipment, to carry loads up to the axle limit, which will increase the paying loads handled in these cars.

In the past, objections have been raised to permitting certain cars to be loaded to their axle carrying capacity on account of the truck or body details or both not having been designed with a factor of safety sufficient to permit them to be loaded beyond their nominal capacity. To provide for this contingency, the committee suggests that the owner of such cars be permitted, on authority of the Car Construction Committee, to mark down the Total Wt of the particular series of cars to the proper figure and place after such figure the size of axle with which the car is equipped, for example: A 100,000 lb. capacity

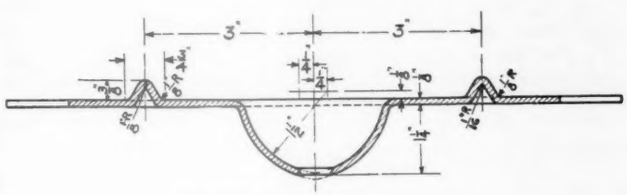


Exhibit B, M. C. B. Sheet 31

coal car can only safely carry 110,000 lb. of lading. The light weight of the car is 38,000 lb. The car should be marked as follows:

MAX LOAD ..... 110 000 Lb.
LIGHT WT..... 38 000 Lb. New 3—19

TOTAL WT..... 148 000 Lb. 5½ in. by 10 in. M. C. B. Std. Axle.

The only time the axle stenciling will be placed after the Total Wt is when the total weight is less than the prescribed allowable axle load.

With the proposed markings it is understood that when the light weight of the car is changed for any reason the maximum lading in pounds will also be changed. The total weight only changes when the type of Non-M. C. B. standard axle is changed to M. C. B. standard. The proposed markings involve changes in the M. C. B. Rules of Interchange and the committee will formulate these changes for submission to the Arbitration Committee when the plan is agreed upon.

With the adoption of the Max Load and Total Wt markings the nominal capacity marking is unnecessary. The new markings will require three lines for stenciling under the initials and number of the car and, as the distance from the center of the coupler to the bottom of the numerals in the number is fixed within certain limits, it leaves no space in which to stencil the cubical capacity of the car. The committee is of the opinion that the cubical capacity should be placed among the other dimension markings of the car, preferably under the inside dimensions. The committee was not unmindful of the fact that the Transportation, Traffic and Car Service Sections are vitally interested in any changes in the markings of weights, cubical capacity, etc., on freight cars and, therefore, the secretary arranged for a joint conference between this committee and the committees representing these sections. The representatives fully concurred in the report of this committee and considered the proposd mark-

ings essential and adequate. It was pointed out that the adoption of these markings will necessitate revisions in the tariffs.

Norfolk & Western Special Axle 5¼ in. by 9 in.

The Norfolk & Western desired to have its special 5¼ in. by 9 in. journal axle included in the table with Non-M. C. B. standard axles, claiming that this axle is good for a total weight of 152,000 lb., the dimensions of the axle now being as follows: Journal, 5¼ in. by 9 in., dust guard seat, 6⅜ in. diameter, wheel seat, 6½ in. diameter, center of axle, 5⅝ in. diameter, with 6 ft. 4 in. center to center of journals. Inasmuch as the wheel seat on this axle is the same as on the 5 in. by 9 in. axle, although other dimensions are greater, the committee cannot assign a greater load to this axle than the standard 5 in. by 9 in. axle.

Remuneration for Light Weighing Cars

The question has been raised whether the present remuneration as given in the Rules of Interchange for light weighing cars is sufficient to reimburse the road performing the work. The committee has carefully checked this matter and finds that the present prices in the Rule of Interchange are adequate.

Spring Plates—M. C. B. Sheets 31 and 31-A

C. B. Young, Manager, Inspection and Test Section of the United States Railroad Administration, calls attention to the height of the boss on the spring plate shown on M. C. B. Sheet 31 not being clearly defined, as well as differing from the height of the boss shown on M. C. B. Sheet 31-A. The committee concurs in the suggestion that the drawings should be clarified and recommends that the height of the boss be made ⅜ in. in the clear, the dimensions in the detailed views changed to accord with this dimension, and an enlarged view added to the section showing the recess for the bolt heads in the spring caps, showing the detail of the boss as per Exhibit *B*. In addition to the above the committee recommends that a note be added that the bolt must be riveted over the nut.

Five Inch by Nine Inch Passenger Journal Box—Dust Guard Well

The secretary referred correspondence originating with the T. H. Symington Company to this committee, advising that the dust guard well on the 5 in. by 9 in. passenger journal box differs in dimensions from the dust guard well for the 5 in. by 9 in. freight journal box, and that this difference interferes with the interchanging of pattern parts. In 1916 changes in the dust guard well for the 5 in. by 9 in. freight journal box were adopted by letter ballot, but corresponding changes were not made in the 5 in. by 9 in. passenger journal box, and they should be the same.

Recommendations

The committee recommends: That the following be submitted to letter ballot for adoption as Standard:

1. Marking cars with Max Load, Light Wt and Total Wt as per paragraph 7 of this report.

2. Marking the cubical capacity under the inside dimensions as per paragraph 13 of this report.

That the secretary be instructed to make the necessary changes:

3. In the spring plates shown on M. C. B. Sheets 31 and 31-A to accord with Exhibit *B* of this report and that a note be added reading "Rivet bolt over nut."

4. In the dust guard well of the 5 in. by 9 in. passenger journal box shown on M. C. B. Sheet 8-A to conform to the dust guard well for the 5 in. by 9 in. freight journal box shown on M. C. B. Sheet 8.

The report is signed by J. T. Wallis (Chairman), Pennsylvania; E. W. Pratt, Chicago & North Western; James Coleman, Grand Trunk; J. J. Tatum, United States Railroad Administration; Major E. C. Schmidt, New York District Ordnance Office; W. J. Robider, Canadian Pacific; J. McMullen, Erie; A. R. Ayers, New York, Chicago & St. Louis; E. G. Chenoweth, Chicago, Rock Island & Pacific; J. J. Maginn, Cincinnati Northern, and B. B. Milner, New York Central.

Discussion

H. H. Harvey (C. B. & Q.): In page four, paragraph 10, sixth line, where it refers to the question of marking down the present cars, I would like to ask the committee what they have in mind with regard to the owner of the car applying to the Committee on Car Construction for permission to do so.

Mr. Ayres: That is only as a general check, as there is a standing committee on car construction.

Mr. Harvey: It seems to me, especially as the roads will probably go back to private management, that the owner will be the party who is the better judge as to whether the car is strong enough to carry the marked capacity than anyone else. He knows the equipment, the time it was constructed, and knows how it has been kept up. I approve the report as a whole, but do not see the necessity for that particular recommendation.

Mr. Gaines: I have heard a great deal of criticism in the last two or three years of a lot of old equipment to the effect that the present condition of the car is not strong enough to carry the loading that would be given under this new maximum loading rule. There should be a clearing house of this association to determine whether such cars are justified in carrying the loads as marked before they are checked up by some committee. It is proper for some association like this to see whether they are strong enough to carry the loads, instead of allowing them to go around the country because the owners would like to have them do so.

Mr. Harvey: It is not a question of the trucks; it is largely a question of body construction. A 100,000-lb. capacity car will carry 92,000 lb. of freight in certain commodities, but if you load it with bulk grain it may not carry it safely. The body of the car is not heavy enough to carry it. The new cars will carry 86,000 lb., and you ask the older cars to carry 6,000 lb. more than the new cars. For this reason the owner ought to have the right to mark down his car, if he so wishes, without referring the matter to the Committee on Car Construction.

T. J. Burns (M. C.): There is a matter which is more important than that, and has to do with the first recommendation on page seven. You are providing a remedy that will not be operative for years to come. We know how long it took us to get the safety appliances on the cars, and we have an idea how long it will take us to have the cars properly stenciled, and in the meantime, while the stencils are being put on the cars, they are going around overloaded. We have a great deal of trouble with 60,000-lb. capacity cars, and few roads are observing Rule 86 as it was intended it should be observed.

Since I came to the convention, I received a letter from our federal manager and chief operating officer, which, in part, reads:

"I am surprised at the general application of this order (Rule 86). No two railroads in the country appear to be applying the instructions alike. This is a confusing operating arrangement and also has a strong tendency to bring about discord among various shippers." Further on, he recommends that the matter be brought before this convention, to see if the members of the association have any suggestion to make to straighten out the matter. I do not know exactly how the committee can handle it, but there should be some court that will have the necessary authority to make the people observe this rule in the true spirit.

J. J. Hennessey (C. M. & St. P.): Without attempting to criticize the report of the committee, there is one thing I want to call to the attention of the association. You equip a car with a 60,000-lb. or 80,000-lb. standard M. C. B. axle, and so mark it. I receive that car in a short time, after you have so stenciled it, with the proper size axle under the car to carry the load according to the stencil, but I apply a non-M. C. B. 60,000-lb. axle, that is turned down in the wheel seat. Will you hold that car up in interchange? You cannot get anything into the rules and make it binding, unless you run the danger of holding up cars interchange, and I do not believe you want to do that. This subject should be handled very carefully indeed, because these interchanges of axles will be made.

J. A. Pilcher (N. & W.): The report of the committee, paragraph 15, refers to the application of the Norfolk & Western, in regard to an additional non-standard axle, in which the committee refuses to accede to the request to put this additional non-M. C. B. axle in their list, and I wish to bring before the Association the full significance of this ruling to the railway company.

The axles in question have been in service since 1899, so far as size of the journal is concerned. At that time the wheel

seat, which is the critical point referred to by the committee, was 6⅜ in. Several years later the wheel seat for this axle was increased to 6½ in.

In paragraph 15, the committee brings out the point that the 6½-in. wheel seat is the standard diameter of the 5 in. by 9 in. axle. That is true, but the rules of interchange and the table in Exhibit A, allow the wheel seat of a 5 in. by 9 in. axle to be made as low as 6¼ in.

In paragraph one, on page one, they speak of the failures being due to overloading. The question of failure from overloading is largely a question of experience, in so far that all of our stresses in shapes or structures, have been determined upon someone's experience. In all the twenty years' service of these axles, there has never been a single report of an axle breaking in the wheel seat, even though a large number of them were originally 6⅜ in.

I wish to ask that this additional non-standard M. C. B. axle be put in this list, in accordance with the letter to the committee, with one modification. We stated in the letter that we desire 152,000 lb. as the load. We would like to modify that and use 148,000 lb., as that will take care of the real carrying capacity of the cars—110,000 lb. in most cases—and allow, at the same time, throwing the axle stresses well within the limits as established in the standard M. C. B. axles.

I wish to illustrate that by referring to the variations of weight and comparing this axle with the standard M. C. B. 5-in. by 9-in. axle and the standard M. C. B. 5½-in. by 10-in. axle. I will make the first comparison with the 5½-in. by 10-in. axle. The decrease in weight is 8 per cent of the decrease in the strength of the axle at the wheel seat is 10.7 per cent. That looks as if it was below the standard axle, but you have further to take into consideration that the distance from the center of the bar to the center of the rail, measured in a horizontal line, is reduced one-half inch, which is equivalent to a 5.5 per cent reduction; so if we add the 5½ per cent to the 8 per cent, we have practically 13 per cent reduction in stresses and 10.7 per cent in reduction of the strength of the axle at that point. It is, therefore, well within the limit at the wheel seat.

Comparing it again with the 5¼-in. by 9-in. axle, using the 148,000 lb. and 132,000 lb., the lengths there are identical. The increase in lading is 12.1 per cent. The increase in the strength of the axle at the wheel seat is 12.5 per cent. As a matter of safety and strength, it meets all the requirements of the M. C. B. axle.

I therefore move that this non-standard M C.. B. axle be placed in the iist with the others.

As to the operation of the rule, it is significant to the company that they have now in service, so far as we know, something over 14,000 open-top coal cars, so constructed. None of these cars have been built since 1909, so that you will see we started to be good 10 years ago. By cutting down the capacity of these cars on an average of 10 tons, that would be equivalent to a destruction of 2,800 50,000-lb. cars, the value of which, if you put it on a liberal basis, would be something like $7,000,000. If we should estimate the carrying capacity of the cars on the basis of mileage of the cars during the year 1916, of which we have a record, and allowing only half the mileage to be the loaded mileage, it would reduce the capacity something over 1,000,000,000 ton-miles.

R. L. Kleine (Penna. Lines): The present chaotic condition of the markings of cars and the amount of loaded carrying capacity has brought about a recommendation on the part of the U. S. R. R. A. Car Service Section to get a uniform marking, in order to obtain the maximum loaded carrying capacity on the cars, and as well to overcome the trouble that has been experienced with broken axles in service. The matter was referred to the Car Truck Committee to solve the proposition.

We well know that the M. C. B. standard axle has been abused in that it has been turned down below the safe limits set for the particular axle, and I do not think we can justify Mr. Hennessey's statement that, due to expediency, we have disregarded the safe loading on the axle and turned it down below the safe limits, and ask to continue such practice.

The committee has taken all of these details into consideration, and formulated the safe loads on the standard axles, as well as figuring the non-standard axles by the same formula as the standard axle was figured, and in cars now in service, we do not think that the standard axle will have to be marked down to the figures presented by the committee.

The committee has had a joint conference with the Car Service Section, and also with the Traffic Section, and they have unanimously agreed to the markings as recommended by the committee.

In regard to submitting to the car construction committee such questions as marking down the cars below the carrying capacity, the thought, there, was that the controversies might arise where a car has been marked in accordance with the standard axle under the car, and the car shows weakness in service. When such occasion arises there will be a controversy between the road on which the car failed and the car owner, and it was thought best that such controversies should be submitted to the car construction committee.

In regard to the Norfolk & Western axle, the committee carefully considered the subject. This is a special axle of the same length as the 5-in. by 9-in. axle. They have larger diameters as to journal, also center of axle, but their wheel seat is exactly the same dimensions as the M. C. B. 5-in. by 9-in. axle—in other words, 6½ in. Mr. Pilcher did not allow for any turning down of the wheel seat in service, where they changed the wheels under any such cars. The figures given by Mr. Pilcher are entirely correct, in accordance with the formula, that if the axle has a wheel seat of 6½ in. it is good for a load of 148,000 lb., but if the wheel seat is turned down to 6⅜ in.. it is good for a load of 140,000 lb, and if turned down to 6¼ in., which is the minimum limit for the 5-in. by 9-in. axle, it is good for 132,000 lb. Axles, under the N. & W. cars referred to, have wheel seats turned down to 6⅜ in. and 6¼ in., and therefore, the committee could not consistently accept the recommendation of Mr. Pilcher.

For many years we have talked about the overloading of our refrigerator cars, considering the size of the journal that was under the car and the capacity marking on the car. Now, we all agree that the refrigerator marking was not correct considering the diameter of the axle under the car. After a while we found a lot of our cars weak and we began to apply steel underframes, steel centers and steel ends, and other improvements and added to their weight. Finally we found that our box cars had the journals overloaded with the marked capacity they were supposed to carry, considering the 10 per cent added.

Mr. Pilcher brings out the dimensions of his axle. He says it is strong. The 5½ in. by 10 in. axle was established because its dimensions were found necessary in order to carry the load that the car was supposed to carry, that it was placed under. He has not made any mention as to what the load would represent on the journal, or the journal bearing, that would increase the heating of his 5 in. by 9 in. journal over the 5½ in. by 10 in. journal. He probably didn't break the axle at the wheel seat, but probably broke the journal off because it was frequently hot.

Chairman: I would like to ask Mr. Pilcher whether any record has ever been kept of loose wheels.

Mr. Pilcher: We have loose wheels, but I am sure there are no more loose wheels in connection with this construction than any other construction we have. The loose wheel construction is not a question of the particular size of that axle fit. It is a very serious matter to cut out such a large hauling capacity in the country at this time, and the cost of replacement is so very great.

I would like, therefore, if I could get a second to my motion, so that the matter could come up for a vote, if nothing else, to see if we cannot stave off this enormous expense .

Mr. Kleine brought out the point of the turning down of the axles. Penalize us when you find them turned down, and don't penalize those that are not turned down.

There has been no indication whatever of any unexpected or any unusual heating that would bring about the breaking of these axles in the journal. We have had broken axles, due to hot boxes, but I cannot say that any one of them was this particular axle.

Mr. Gaines: I would like to ask the Secretary when the 5½ by 10 axle was first made the standard of the Association.

Secretary: That was in 1899, Mr. Gaines. In 1901 the diameter of the wheel seat was changed from 6⅞ to 7 in.

H. W. Coddington (N. & W.): It is my duty to make a report on all of these failures wherever they occur, and it is our experience that we have more broken journals in the boxes in

the journal bearing on the 5½-in. by 10-in. journals than we have in the 5¼-in. by 9-in. It is very seldom that we ever have a 5¼-in by 9-in. axle failing in the journal bearing section.

Mr. Tatum: I would like to know if there is any comparative records kept or is this simply surmise? Have we a comparative record of the number of hot boxes we have on a 5-in. by 9-in. journal carrying 100,000 lb. capacity load, with other cars equipped with the 5½-in. by 10-in. journal, to measure up the difference existing on that railroad? If you have one I would like to know what it is.

Mr. Coddington: I was speaking about journal failures, not hot boxes. I understood Mr. Tatum took the point that way. I have a record of that. The motion to permit the use of the 5¼-in. by 9-in. journal was put and lost.

A motion that the report of the committee be received and the recommendations referred to ballot was carried.

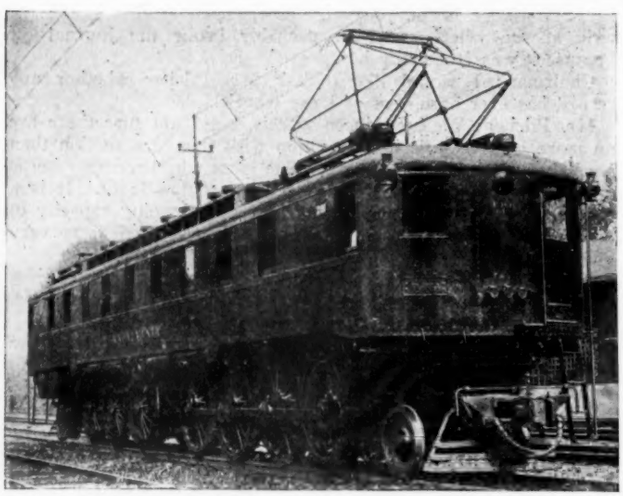
Mr. Ayers: I don't know that this requires any action by the convention, but it is a matter to which Mr. Barnes refers, and I would like to speak a little on it. It will possibly involve other and similar questions. That is, the matter of getting this rule about the maximum load followed out. It will not be taken care of at all by changing our Rules of Interchange, because the trouble goes a good deal farther back than the inspector. The trouble originates with the shipper, and I don't know just how the question can be handled. It is probably one for the Executive Committee, but the matter will have to be controlled before it gets to the Mechanical Section people, it seems to me.

Report of Committee on Tank Cars

The report of the Committee on Tank Cars was presented by Mr. Gibbs, and a lengthy discussion ensued. This dissussion will be published in the next issue of the Daily, next Monday morning.

Moving Tonnage in Large Units

THE ABILITY TO INCREASE TRACK CAPACITY for the rapid expedition of heavy freight trains is fast becoming a difficult problem, owing to the tremendous increase in train tonnages to be moved as a unit. In other words, the problem before many steam railroad operators is how to increase the physical capacity of a



Pennsylvania FF1 250-Ton Electric Locomotive

certain heavy tonnage division without prohibitive expense. At the same time, after such an expenditure in correcting alignment, grade reductions and other operating difficulties, there still remains the problem of operation, namely hauling without delay the tonnage offered for transit.

With the introduction of the large FF1 250-ton locomotive of the Pennsylvania Railroad, on exhibit at the Pennsylvania Electric Station, Tennessee Ave., there dawns a new era in the possibility of moving heavy tonnage in large units over steep grades. The locomotive has a maximum accelerating horsepower of 7600, with a sustained horsepower capacity of 4800 for one hour. With two of these engines a 6300 ton train can be handled up long grades at constant speed; for instance on a 25-mile 1 per cent grade, such a train could be moved at 20.6 miles an hour.

The Pennsylvania FF1 locomotive was built within existing operating limits, including the maximum starting draw-bar pull which average freight cars will permit; the maximum tractive effort consistent with the wheel arrangement used; the maximum weight on drivers; the maximum horsepower per unit weight, and the maximum speed considered desirable for contemplated operation.

Registration, American Railway Association, Sec. III, Mechanical

Eimer, Wm., S. M. P., Penna. B. & A. V. Div., Marlborough.
Gray, C. B., Penn.
Hellman, Chas., Pitts. & Shaumont.
Hess, Geo. F., S. M., K. C. Southern, Traymore.
James, Chas., M. S., Erie.
Kimmett, M. A., G. F. C. D., C. R. R. of N. J., Arondale.
Lee, F. H., A. S., F. C. D. of the B. & O.
Long, B. O., So. Pac.
McMunn, W. R., A. S. R. S., N. Y. C., Shelburne.
Pratt, E. W., A. S. M. P. ,C. & N. W., Marlborough.
Robbins, F. S., A. G. F., Penn., Haddon Hall.
Shepard, L. A., Brighton.
Vaughan, H. H., Dominion Bridge Co., Marlborough.
Wintersteen, J., M. M., Cornwall R. R., Arlington.

Special Guests

Anderson, H. A., Asst. P. A., Pa.
Baker, C. N., M. M., Tennessee, St. Charles.
Barton, Wm. R., Chief Draft., N. Y. N. H. & H., Osborne.
Borup, Mrs. O. V., Draftsman, B. & O., Pennhurst.
McCampbell, Jas., M. M., Ft. Smith & Western, New Strath Haven.
Clark, Edward, Gen. Mech. Fore., Cornwall, Arlington.
Clifton, W. H., Asst. P. A., B. & O., Breakers.
Corbett, A. B., Shop Supt., M. K. & T., Osborne.
Cornwell, Wm. H. R., H. D. F., P. East Lines, Strathhaven.
DeGuire, G. N., Gen. Supr. of Equip., U. S. R. R. A., Marlborough.
Dynan, T. J., Secy. to Mech. Asst., East Reg. U. S. R. R. A., Breakers.
Dugdale, Geo., U. S. R. R. A., Marlborough.
Dunn., Col. B. W., Ch. Insp. Bur. of Expl., U. S. R. R. A., Breakers.
Enwright, J. T., Insp. Wgts. & Meas., Bur. of U. S. R. R. A., Strand.
Ford, J. F., Fore. Frt. Dept., B. & O.
Grams, S. C., For. Passenger Shop, B. & O.
Grant, W. M., Boiler Shop For., Penna. E. L., Strathhaven.
Grant, J. E., Insp., A. R. A., Sterling.
Hall, C. B., Asst. P. A., Pa.
Hammond, R., M. M., N. Y. N. H. & H.
Henry, H. B., Asst. Dir. of Pur., S. P., Traymore.
Hill, J. P., Storekeeper, W. J. & S. S.
Hodges, A. H., M. M., B. & O., Normandie.
Ingersoll, Howard L., Mech. Asst. to Reg. Dir., East. Dist., Traymore.
Kapinas, G. H., G. F., B. & O.
Kimmett, M. A., G. F. D., C. R. R. of N. J., Avondale.
Lawson, A. B., Draughtsman, B. & O., Arlington.
Lehr, N. W., Gen. Foreman, P.
Madden, T. P., Gen. Boiler Insp., M. O. P.
G. N. Norman, Pa.
Parker, W. T., Machinist, W. J. & S. S.

Pinkerton, N. W., Asst. Eng., N. Y. Cen.
Poley, G. M., Architect, A. C. L., Strand.
Price, Towson, 3rd Asst. Exam., U. S. Patent Office, Kingston.
Roberts, Geo. S., Shop Insp., Penn.
Rogers, N., Asst. Sec. to Dir. Div. of Operation.
Rhul, Andre, M. E., Branch P. L. M., Chelsea.
Shank, H. T., P. A., L. & N. & L. N. & St. L., Chelsea.
Driscoll, F. E., Asst. Pur. Agt., Erie, Traymore.
Whitsitt, W. B., Chief Draft, B.& O., Arlington.
Williams, M. A., Blackstone.
Wheeler, H. B., Fore. Mill & Cab. Shop, B. & O.
Van Moss, J. H., Sales Rep. P. Tank Line, Traymore.
Weigle, John, Ret. Foreman, Penn., Elwood.

Important A. R. A. Committee to Meet Here

THE COMMITTEE ON GRADE CROSSINGS, Protection and Trespassing of the American Railroad Association will hold a meeting at the Marlborough-Blenheim Hotel on Monday. The committee is composed of the following railroad officers: Col. A. J. McCrea, chairman; C. L. Bardo, general manager, New York, New Haven & Hartford; J. Q. Van Winkle, general superintendent, Central Indiana Railroad; D. H. Beatty, superintendent of safety, Southern Railroad; W. J. Towne, assistant general manager, Chicago & Northwestern; J. H. Dyer, general manager, Southern Pacific Company; T. S. Stevens, signal engineer, Atchison, Topeka & Santa Fe; F. L. Thompson, chief engineer, Illinois Central, and C. H. Tillett, acting signal engineer, Grand Trunk.

"Look Me Up"

"I want to register a kick," said the tired car inspector, buttonholing The Man Who Saw.

"I got here at 10.00 A. M. this morning. At 10.02½ A. M. Dan Gitem, of the Fit-em-all Equipment Company, had my pedigree and a promise to bring my wife, and lunch with him at noon.

" 'Look me up,' he says.

"Where are you at?" says I.

" 'Booth 4076.' "

" 'All right, Dan, we'll be there with our hair in a braid.'

"Well, it's nearly one o'clock now and me and Mary here have been trudging all over the place to find booth 4076. We went through 2,000 of them and got tired—can you take us there direct?"

The Man, having qualified as a puzzle expert in the postoffice department, felt that he had acquired a sufficient knowledge of the intricate lay out of booths on the Pier to guide them safely to Dan Gitem's lair, and they started off.

"Why," said the Inspector, "doesn't somebody hand out a map so a fellow can find his way around? It might be a good idea to divide the whole exhibit floor into sections A, B. C, etc., and list the numbers as A1, B1, etc.,—anybody who could read could get there then."

"Perhaps," suggested The Man, "there may be 'method in their madness.' The object of the arrangements here is to assure the spectator that he won't miss anything. For this reason the exhibit spaces are laid out in such a manner that no matter what booth he starts out for, he is automatically sidetracked along by-paths which contain things he really shouldn't miss. From there, it is but a willing step farther to the next—and although he gradually gets away from his objective, in the long run he wins. He wins a liberal education."

"Well, well," said the Inspector, "I had a hunch that there was a purpose behind it—let's hurry, I'm hungry."

Conventionalities

James E. Tierney, master mechanic of the Louisiana & Arkansas at Stamps, Ark., is here with Mrs. Tierney and the future master mechanic of the L. & A., Master Stanley Tierney.

Mr. and Mrs. Burton W. Mudge are attending the conventions as usual. Their son, Burton, Jr., was unable to come with them, as he is taking some important examinations in school, but he expects to come later.

B. L. Winchell, regional director of the Southern region, was accompanied to Atlantic City by Mrs. Winchell. They stayed here until yesterday and then went to New York to visit Mr. Winchell's mother, who is now 83 years old.

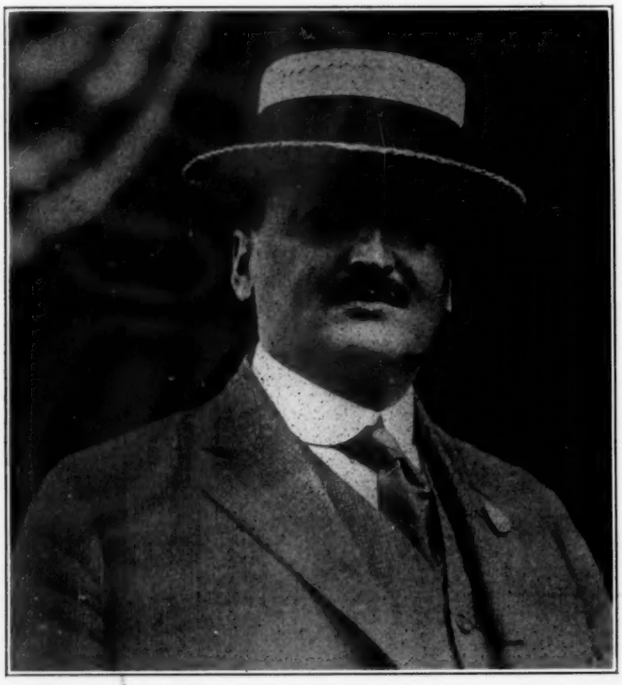
D. H. Kinter, General Foreman Car Department, Monongahela Railroad; Mrs. Kinter and Miss Grace Kinter

D. J. Champion, President of the Champion Rivet Co., is here as usual. We say "as usual" because while Mr. Champion can not lay claim to the "long distance" record, that having almost been conceded to Frank Edmunds, he has been coming a long time.

Left to Right—R. J. Leslie, Draftsman, Car Department, P. R. R.; C. Geisking, General Foreman P. R. R., and G. T. Baker, General Car Inspector, P. R. R.

W. H. Keller, president and general manager of the Keller Pneumatic Tool Company, Grand Haven, Mich., arrived Thursday from New York, bringing with him export orders for Keller tools approximating a quarter million dollars. Mr. Keller reports business brick with his company. An enlargement of the Keller factory to nearly double its present capacity is planned for the near future.

E. G. Jackson, president and general manager of the International Equipment Company, Montreal, representing in his territory the American Steel Foundries, Keyoke Railway Equipment Company, National Maleable Castings Company and Edwin S. Woods & Company, is at the Traymore.

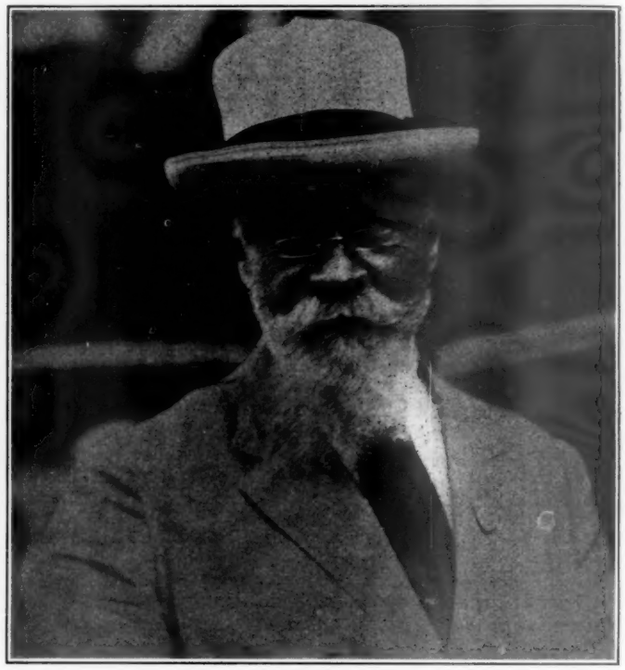


G. Villard, Manager American Railroad of Porto Rico, San Juan, P. R.

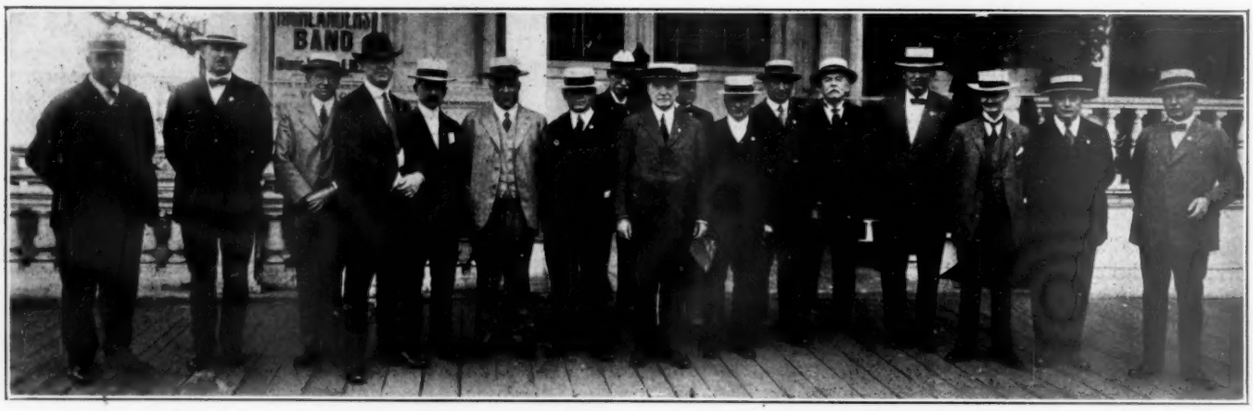
Mr. and Mrs. E. W. Pratt, who have been attending the conventions for years, arrived on Thursday, a little later than usual. Some months ago Mr. Pratt, who is assistant general superintendent of motive power of the Chicago & Northwestern, secured leave of absence for six months and has since been enjoying himself. He took leave of absence merely to get a good rest and we expect to see him back on the job in the railway business one of these days.

So far as we are able to ascertain, the only Canadian railway officer at the convention is W. A. Booth, of Montreal, successor to James Powell as chief draftsman of the Grand Trunk and also as secretary of the Canadian Railway Club. Labor conditions have prevented our Canadian friends from coming to Atlantic City this year.

F. J. Foley came to the conventions this year as general sales agent of the Railway Steel Spring Company, having been appointed to that position recently, following the death of S. T. Fulton, vice-president in charge of sales. Mr. Foley is a sales agent who thoroughly knows the products he is selling, as he was until his recent promotion general superintendent of the plants of the company. He was accompanied to Atlantic City by C. K. Shreve, assistant secretary of the company.



M. N. Groten, First Assistant Engineer, Russian Commission on Ways and Communication



Executive Committee, American Railroad Association

Left to Right—B. F. Bush, Regional Director, Southwestern Region; Hale Holden, Regional Director, Central Western Region; B. L. Winchell, Regional Director, Southern Region; W. T. Tyler, Director of Division of Operation, U. S. Railroad Administration; J. E. Fairbanks, General Secretary, American Railroad Association; R. H. Aishton, Regional Director, Northwestern Region and President, American Railroad Association; C. H. Markham, Regional Director, Allegheny Region; G. L. Peck, Federal Manager, Pennsylvania Lines West; N. D. Maher, Regional Director, Pocahontas Region; T. C. Powell, Director of Division of Capital Expenditures; A. J. Stone, Federal Manager, Erie; H. E. Byram, Federal Manager, Chicago, Milwaukee & St. Paul; J. M. Hannaford, Federal Manager, Northern Pacific; E. H. Coapman, Federal Manager, Southern Railway; A. T. Hardin, Regional Director, Eastern Region; J. E. Gorman, Federal Manager, Rock Island; W. J. Jackson, Federal Manager, Chicago & Eastern Illinois.

A lapse of three years defines sharply how much these meetings partake of the spirit of family reunions. Men and women are here to whom the convention has been a definite part of their lives annually. The Ashton family represents this type in a high degree. Mrs. Emma C. Ashton, the wife of Henry G. Ashton, has attended these

W. G. Phelps, Purchasing Agent, Pennsylvania Lines West

meetings for more than forty years. Her son, A. C Ashton, who has married since the last convention, brings his wife.

E. S. Wortham plays a good game of golf. He is a member of the Glen View Club, Chicago. When we were in Atlantic City in 1916 he played in the M. C. B. and M. M. golf tournament. He made a fine score, but failed to win a prize. The reason was that the handicap committee, knowing that Mr. Wortham was suffering with a case of poison ivy, made him a "scratch" man. Mr. Wortham, Frank L. Norton and George L. L. Davis, all of the Scullin Steel Company, are guests of the Marlborough-Blenheim.

The name of James M. Hopkins should be added to the list of "farmers" we mentioned in the daily the other day. And, by the way, he is no longer president of the Camel Company, Percy M. Elliott having succeeded him. "Farmer" Jim motors occasionally from his country estate near Libertyville, Ill., to Chicago, where he assumes his duties of chairman of the board of the Camel Company. After a fine record of attendance at the conventions Mr. Hopkins remains at home this year.

How children are trained up in the way they should go finds an example in the Bullard Machine Tool Company. Edward C. Bullard, grandson of the founder, is assisting demonstrators at the pier exhibit. He is a graduate of Sheffield School at Yale, and enlisted in the army and was assigned to the Ordnance Department, where he did active duty. On being released from the government service he began the routine shop education in the Bullard plants. This means a three-year term of apprenticeship, which includes work in all departments.

J. E. Erwin, a 20-year member of the A. R. M. M. A., probably has the unique distinction of representing a railroad at the convention owned by an orphans' home and so far as known, the only one in the world. Mr. Erwin is master mechanic of the Sand Springs Railway and hails from Sand Springs, Okla. This railroad has a history. Charles Page went to Oklahoma about 12 years ago a poor man. His youth had been beset with hardships and deprivation because of the necessity of providing for a mother with a large family, and he firmly resolved that if the time ever came he would in some way lighten the burden of widowed mothers and orphans. In a short time he acquired undeveloped "Indiana country" and struck it rich in oil. He built the railroad with no prospect of immediate, paying business and then built the business on the railroad. It is today both steam and electrically operated and is the smallest, large railroad in the mid-west, both from a passenger and freight earning basis. He subsequently built the Sand Springs Home, a widows' and orphans' colony, where widows are given an opportunity to help themselves and where orphans are given the advantages of a home and a good education. This home provides for nearly 600 children and 70 widows, and includes a cannery, greenhouses, dairy, hospital, cold storage and ice plant, manual training school and other educational institutions. The Home owns the railroad and other business concerns established by Mr. Page and all are dividend payers.

Left to Right—George C. Weight, General Car Insector, P. R. R.; F. S. Kent, General Car Inspector, P. R. R.; Captain C. R. McKinsey, Captain Engineers (ex-Master Mechanic, Washington Terminal); Captain J. M. Rank, Staff of Director General, Military Railways; Charles E. Boyer, General Car Inspector, P. R. R., and Frank E. Taylor, General Car Insector, P. R. R.

Those who have met W. E. Dunham, assistant to the general superintendent of motive power and car department of the Chicago & North Western, only during working hours and know only his serious characteristics will not suspect that there is a recognized humorist in the Dunham family. His friends at the convention, however, will not be surprised to learn that Mr. Dunham's son, who is a sophomore at Cornell University, has been elected to the staff of *The Widow,* the humorous periodical published by the undergraduates.

C. H. Hogan, assistant superintendent of motive power of the New York Central at Albany, N. Y., was given badge No. 999 when he registered on Friday. This was not intentional but it is quite significant because of the reputation which he made as an engineer on the New York Central's Empire State express on the famous engine numbered "999."

To the old guard at the convention the Crane Company's booth without Frank Fenn looks almost as strange as a performance of "Hamlet" without the Prince of Denmark. For many years he has been a regular attendant at the Atlantic City conventions, but at present he is taking a much needed rest on his farm at Chillicothe, Illinois.

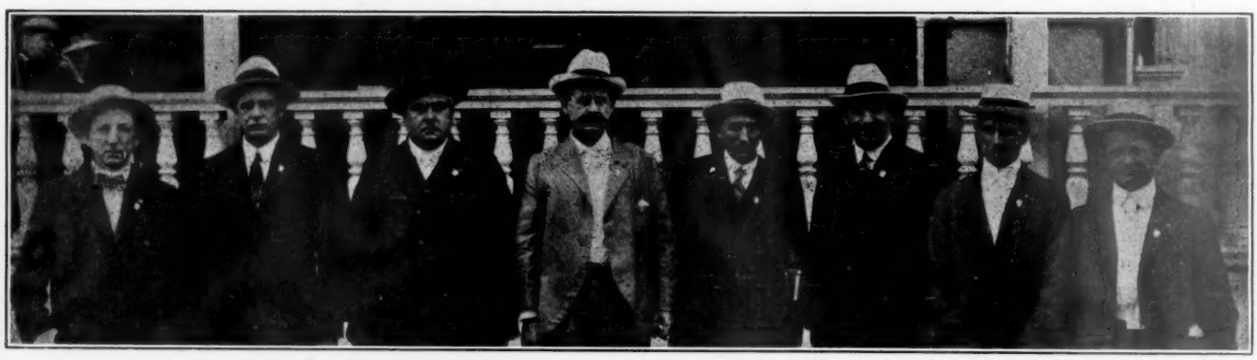
Major John R. Jackson, since his discharge from the army Ordnance Corps, has joined the staff of the chief mechanical engineer, Division of Operation of the Railroad Administration, and is attending the convention as a special guest this week. Major Jackson was formerly assistant engineer of tests of the Santa Fe, leaving that position in the fall of 1917 to enter the Ordnance Department of the army. Out of a total of 18 months in the service he was with the A. E. F. in France for a year. During his service abroad he was liaison officer on the Anglo-American Tank Commission, which was formed to design and construct heavy battle tanks for the joint use of the British and American armies. After five months' service in this position he went with the Engineering Division in the office of the chief ordnance officer, investigating the performance of tanks with the First Army in the Argonne offensive, during the month of October, 1918. This was one of the real fighting jobs of the Ordnance Department and involved the reclamation in the field of tanks put out of service in action. At the signing of the armistice he was with the Second Army at Toul in connection with the motorization of artillery. Mr. Jackson says that it is some job to get back to this country even after assignment for return has been made. In his case it took six months.

Col. John T. Dickinson, widely known as secretary of the World's Columbian Commission at Chicago and who nineteen years ago pioneered the introduction of the axle light system of electric car lighting which is now in universal use on all first-class passenger and Pullman cars, is registered at Haddon Hall with Mrs. Dickinson.

C. E. Slayton, Master Mechanic, Union Pacific, Marysville, Kansas, and Mrs. Slayton

He is now living in Washington, D. C. and is attending the conventions after a lapse of six years.

"Dave Pye," who has been coming to these conventions for many years, was introduced last night to a young lady who is attending this convention for the first time. After being introduced she said, "I don't like nicknames, what is your real name?" Somehow that reminds us of "Jack High." Pye and High are business cronies and occasionally find themselves resting in the same hotel lobby. On such an occasion recently at the Waldorf, a boy with a falsetto voice came up the hall paging "Mr. High," and closely followed by another boy equipped with a basso-profunda voice paging "Mr. Pye." And so they went up and down the hallways and lobby—"High, Pye, Pye, High," much to the amusement of the guests. Our relator doesn't tell whether either Pye or High answered the call.



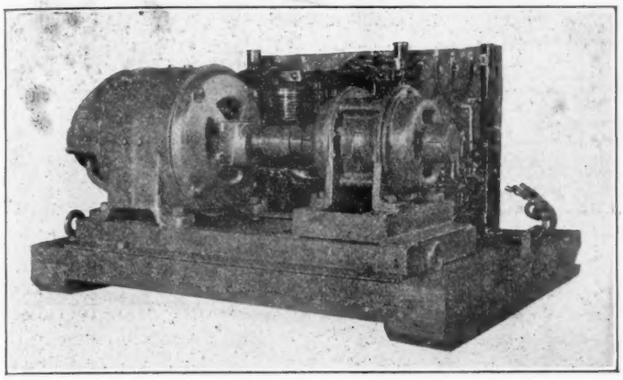
W. P. Borland, Chief of the Bureau of Safety, Interstate Commerce Commission and a Group of His Inspectors
Left to Right—I. P. Kelley, W. F. Wagar, H. M. Burtch, J. E. Jones, W. P. Borland, Joseph Bromley, D. Garman and H. M. Priest

New Devices Among the Exhibits

Welding Sets

THE TYPE WD-9 WELDING EQUIPMENT made by the General Electric Company includes a constant energy self-excited generator to be driven by belt, electric motor, or engine. When belt driven by engines the speed should be 1200 r. p. m. or 1500 r. p. m.

The constant-energy self-excited generator is designed to embody all the characteristics demanded by arc welding service. There is no external ballast resistance or



Self Exciting Welding Generator Direct-Connected to an Alternating Current Motor

separate excitation from any external source. Neither a separate circuit nor direct-connected exciter is used. Since the machine provides its own excitation, the voltage characteristics are such that throughout the proper working range of the arc the energy delivered is practically constant. The voltage and current follow the momentary variation in the arc conditions practically instantaneously, and consequently the lag between change in arc conditions and resulting corrective change in electrical conditions is reduced to a minimum. This lag is a possible source of trouble in welding with self-regulating welding equipments when the automatic feature is embodied in the revolving apparatus or mounted on the control panel.

The generator is so wound as to give a no load or striking voltage of 60 volts which, when the arc is struck, automatically decreases to the voltage required by the arc. This is from 18 volts to 20 volts for the average operator and general work. A long arc is generally considered undesirable. Skilled operators are able to hold a very short arc with a voltage as low as 16 volts, but 20 volts is the average rating of the generator. By adjusting the dial switch on the panel, the current may be varied from a maximum of 200 amperes to a minimum of 75 amperes in 25 ampere steps.

The standard motor generator sets are assembled complete with the panel on a htructural steel base so the entire equipment may be picked up by a crane and handled as a unit, or if desired can be mounted on truck.

The connections are simple, the motor leads being brought out at one end and welding leads at the other. Mounted on the control panel are the motor starter and the generator field rheostat, voltmeter, and series field dial switch.

Belt driven generators are mounted on standard sliding bases, and the control panel is arranged for separate mounting.

Balancer Set

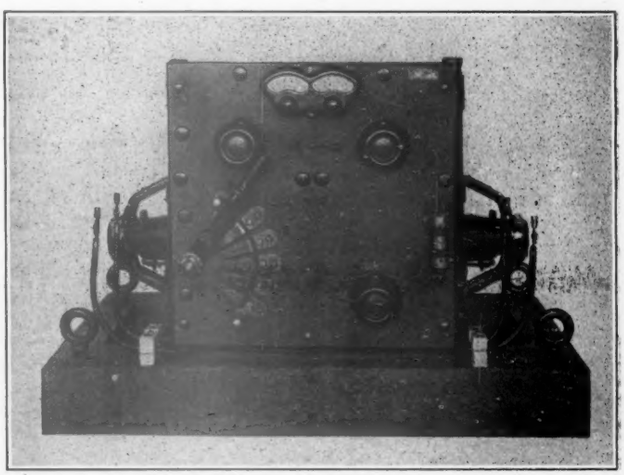
The constant energy arc welding set of the balancer type is a novel type of arc welding equipment which combines electrical characteristics for the arc with high efficiency and light weight. The charactesistics have been determined by a series of practical tests under commercial operating conditions and by oscillograph curves.

This set is built for operation on 110 to 125 volt direct-current supply circuits. The two armatures are mounted on one shaft and connected in series across the 125 volt circuit. One terminal of the welding circuit is taken from the connection between the two armatures and the other from the positive line. By this means each of the machines supplies part of the welding current, and consequently the size and weight of the machines are minimized. The design of the fields and their connections is such that the set delivers the voltage required directly to the arc without the use of resistors.

The welding control panel for the balancer set consists of a slate base 24 inches square, which is mounted on 24-inch pipe supports for portable work and on 64-inch pipe supports for stationary work.

The equipment consists of: a meter and voltmeter inclosed in a common case, dial switch, motor and generator field rheostats, starting equipment, and reactor. The ammeter indicates current in the welding circuit and the voltmeter is so connected, that by means of a double-throw switch, either the line of voltage or the welding voltage can be read.

The dial switch is connected to taps in the series field of the generator, the field being connected to oppose the main field. This feature provides the current control by



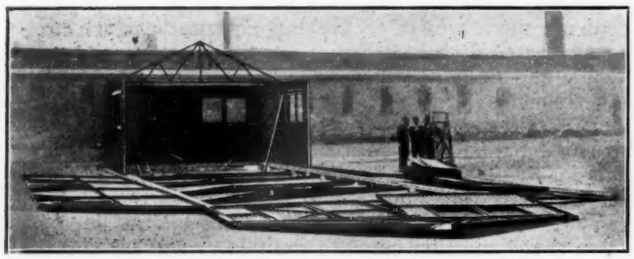
Balancer Type Welding Outfit

which six approximately equal steps are obtained between 50 amperes and 150 amperes. If intermediate current values are required, they can be obtained by means of the generator field rheostat. A small reactor is used to steady the arc and current, both on starting and during the period of welding.

Arc welding is always done on metal which is grounded. Since successful operation requires that the positive terminal be connected to the work the supply circuit should be arranged so that it can be safely grounded on the positive side.

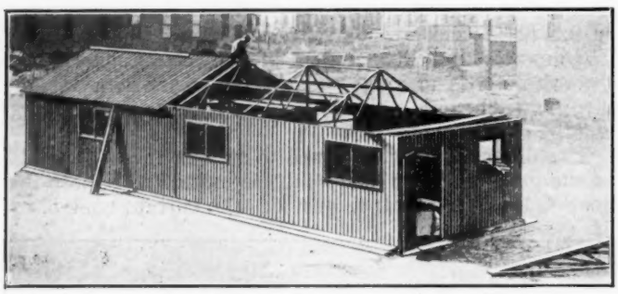
An Easily Erected Steel Building

IN THE APPLICATION of the fabricated idea to the erection of buildings, startling strides have been made during the past year because of the necessity in many industries for strong and durable fireproof buildings which could be erected without the inconvenience of



Starting Erection of Stefco Standardized Sectional Steel Building

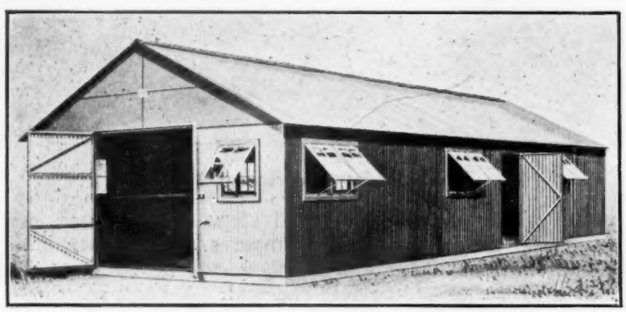
delays and disappointments incidental to the activities of architects, contractors, and skilled labor. A recent development in this type of standardized steel units for building purposes is shown in the photographs. In designing this type of building the engineers had in mind the fact that some of the early constructions along these lines had limitations because of lack of strength. The



Erection of Sectional Steel Building Nearing Completion

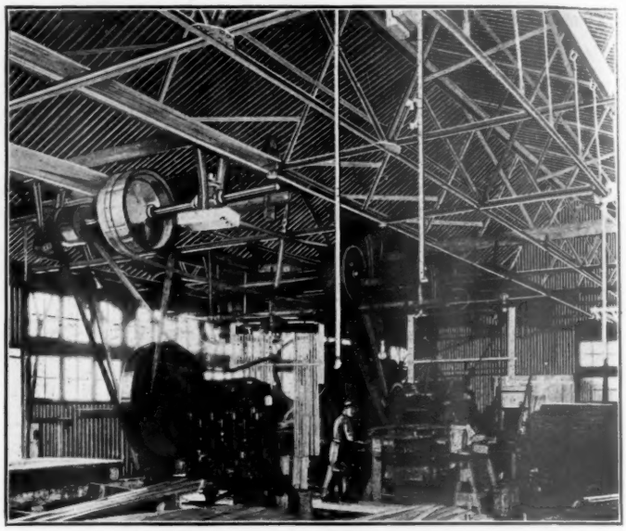
design illustrated is said to be strong enough to stand any of the strains to which an industrial building can be put, and it is further stated that these buildings are strong enough to carry a line of shafting on the trusses without any pillars, trusses or supports.

Practically any combination of window lighting effects can be obtained so that they can be adapted to a varied



Building Completed

line of purposes for manufacturing or for storage. It is claimed that these buildings are so simple to erect that common labor without any supervision, except that of a man who can read simple directions can erect them in a comparatively short time. They can be supplied in any length or width, it being related that one installation has been furnished which was only 80 ft. short of a mile.



These Buildings Are Designed For Heavy Service

The construction described is known as the Stefco structural steel building, manufactured by the Liberty Steel Products Company, New York, who are exhibiting sev- types of them at the convention.

Trunnion Type Coupler and Yoke Connection

A NEW TRUNNION TYPE of coupler and yoke connection which eliminates the tail pin, the functions of which are performed by trunnions cast integrally with the coupler, is exhibited by The McConway & Torley Company, Pittsburgh, Pa. The trunnions are of generous proportions and provide, in addition to great strength, an extra large bearing surface for pulling. The yoke contains a single bearing block which, while readily moved, is normally held securely in place. This feature, in combination with the design of the coupler shank, provides for the application or for the removal of the coupler from the car independently of the yoke.

This trunnion type of connection is also shown in modified form, the coupler and yoke being cast separately but interlocking, in a manner requiring no tail pin, blocks or other details to form the connection, the device consisting simply of a coupler and a yoke.

Collapsible Stake Pockets

THE DAMASCUS BRAKE BEAM COMPANY, Cleveland, Ohio, is showing for the first time a novel form of collapsible stake pocket for application to the inside of gondola cars. It consists of three links of wrought iron chain of the proper dimensions to hold standard sized stakes. When the stake is removed, the chain hangs slack and will not become damaged or distorted, as is often the case with rigid stake pockets on gondola cars. Another new type of stake pocket exhibited by this company is designed for application to flat cars. It has corrugations which prevent vibration and shocks from loosening the wooden stake, thereby preventing the stake from working out and insuring against loss or damage to the lading.